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Egyptian Phonology

An Introduction to the Phonology of a Dead Language

by
Carsten Peust

Göttingen 1999

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Preface

The present book has been written as part of the project "Die Position des Ägyptischen im Sprachraum Nordostafrika/ Südwestasien: Areale und Genetische Beziehungen" which was funded by the Deutsche Forschungsgemeinschaft from 1996 to 1999 within the framework of the "Schwerpunktprogramm Sprachtypologie". My conceptions about Egyptian phonology have profited greatly from intense discussions with Dr. Frank Kammerzell who directed the project. Without his help, this book could never have been written. It is frequently impossible to determine which one of us first developed a particular view on an issue. Thus readers who find useful ideas in this book should always remember that they are not necessarily based on my inspiration alone. On the other hand, I feel fully accountable for any shortcomings of the book or any conceptions that may draw criticism.

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1 Introduction

1.1 General remarks

In several respects, Egyptian is a highly interesting language to work with. A striking peculiarity of Egyptian lies in the length of documented language history. With a history spanning approximately 4500 years, Egyptian exceeds all other languages in this respect and can be of prime importance for historical and diachronic studies of any kind. Egyptian belongs to those language stocks in which both an ancestor language and several genetic descendents (in this case the Coptic dialects) are attested. It can therefore serve for testing and refining models of genetic linguistics.

In addition to the diachronic variation, the linguistic situation in Egypt has been characterized by considerable diastratic differentiation during most or all periods. We can actually say that multilingualism has played a greater role in Egypt than in many modern western societies. In modern Egypt, two distinct varieties of Arabic, which show pronounced differences on all linguistic levels, are the main vehicles of spoken and written communication respectively. A similar situation existed during all or most of the pharaonic era, where even, in certain periods, two or more linguistically distinct varieties of Egyptian were in use for different types of written communication. Moreover, two or more distinct writing systems were in use throughout the entire pharaonic era.

In addition to the existence of different linguistic varieties of Egyptian itself, we have to consider that Egyptian experienced intense contact with other languages of various genetic affiliation. It can be assumed that there have always been a considerable number of Egyptians who, besides knowing one or more varieties of Egyptian, were familiar with one or several neighboring languages. As a result of such contacts, mixed languages of various types arose, such as Coptic with basically Egyptian grammar but a high and sometimes dominating ratio of foreign vocabulary, or Napatan with basically Egyptian vocabulary but profound grammatical restructuring due to contact with African languages. Since not only Egyptian but also several of its neighboring languages (Semitic languages, Greek, Hittite) are well attested in different diachronic stages, research on convergent linguistic developments within this area is generally promising. It is even possible that certain linguistic features which emerged in the ancient Eastern Mediterranean linguistic area contributed significantly to the development of modern European languages. For instance, the development of the definite article, a characteristic trait linking modern Mediterranean and Western European languages, may find its

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roots here.[1]

The indigenous Egyptian scripts are complex systems in which several graphemic subtypes coexist. Furthermore, while most scripts in the world have different styles for casual writing on the one hand and for printing or careful inscriptions on the other, few of them show deep structural divergences in their writing modes as does Egyptian. In general the study of graphemic theory can certainly profit from taking Egyptian into consideration.

Despite all these factors, the popularity of Egyptian among scholars with a general linguistic background is quite low. The reasons for this are diverse. For example, the complex writing system may seem to many a high barrier to overcome prior to any examination of the language proper, even though the difficulties in interpreting the Egyptian script are not in principle different from the difficulties in interpreting written records of any extinct languages. Another reason is the fact that Egyptology has developed a rather idiosyncratic style in describing the language which is not easily accessible to scholars who have not been educated in this discipline. More recently, however, scholars have begun to describe Egyptian specifically for a linguistic audience (cf. especially Schenkel 1990, Loprieno 1995, and Kammerzell 1998a).

This book is intended to help readers with a general linguistic background become familiar with the basic issues and principal problems of one subdiscipline of the Egyptian language: its phonology. I presuppose the general notions of structuralist phonology as developed by the Prague circle, but adhere to no specific school of modern phonology. Rather, descriptions are frequently presented from a typological perspective. I hope that the book will enable linguists and philologists specialized in fields other than Egyptian to access and interpret Egyptian evidence and integrate it into their own particular studies.

---

[1] The notion of definiteness is an important grammatical category in the languages of modern Western Europe and the Mediterranean. The languages of this area have morphological markers to express the definiteness or indefiniteness of a noun phrase (definite vs. indefinite articles). However in most languages throughout the world, there is no specific morphological category which corresponds to our definite or indefinite article. Instead, definiteness or indefiniteness is either not expressed at all, or may interact with various categories as diverse as case, verbal agreement, or word order. The idea to consider the presence of a definite article an areal feature is due to Martin Haspelmath (lecture in Goettingen, 1997). The development of a definite article can be observed in Egyptian during the 2nd millenium BC. Afterwards it is attested from Semitic, even later from Greek whence it seems to have spread to other parts of Europe in the course of christianization.

In Egyptian and most languages which once aquired a definite article, the numeral "one" was grammaticalized at a later date to develop into an indefinite article. In several modern languages of the Middle East and India (e.g. Turkish, Persian, and Hindi) the numeral "one" is used in an extended function coming close to an indefinite article, whereas a definite article is missing. This is probably another areal feature which may or may not be historically connected to Egyptian.

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My description is somewhat eclectic and does not address all 4500 years of attested Egyptian language history in equal depth, nor are all questions which may seem important treated in detail. I am mainly concerned with the time beginning in the New Kingdom (from approximately 1500BC on) when the first intense contacts of Egyptian with neighboring languages become evident and provide extensive data for phonological research. The phonology of the earlier periods of Egyptian, which must be reconstructed primarily by internal evidence, is treated more briefly. I have largely avoided considering the genetic relations of Egyptian to Afroasiatic or other languages. Even if a phonetic correspondence between genetically related languages is assumed to be certain, the correspondence is of a principally abstract nature and does not allow for a conclusion about the actual pronunciation in one of the compared languages. The situation is different if language contact is attested in historical times. Evidence of this kind is amply referred to in this book. I hope, however, that this book will help other scholars use Egyptian evidence within the framework of genetic reconstruction.

The reader will note that I do not outline synchronic descriptions of different stages of the language in chronological order. Instead, each section is devoted to a particular topic which in turn is discussed from a diachronic perspective. It is a peculiarity of Egyptian linguistics that there is frequently good reason to assume the operation of a specific phonetic process while we cannot establish the exact time at which it took place. Therefore, a relative chronology of individual phonetic changes often remains problematic. This is due to the existence of "dark ages" for which insight into Egyptian phonology is considerably more difficult than for other periods. Several factors are responsible for this: a large tendency to write in an archaic style (e.g. in the centuries following the New Kingdom), the lack of structuralistic investigation into the writing system (Demotic), the lack of words preserved in both an Egyptian and a foreign writing system (Old Kingdom), the small number of known texts (Late Coptic), the lack of strictly synchronic glossaries or grammatical descriptions of several periods, or a lesser acquaintance on the author's side with certain stages of Egyptian than with others.

1.2 Remarks on the transcription and specific terminology used throughout this book

1.2.1 Notation of Egyptian consonants

In this book, Egyptian words are not usually given in the original script but in the conventional Egyptological transcription. This transcription is always printed in italics, e.g. *nṯr* "god". If a single consonant is cited in transcription, it is put in pointed brackets, e.g. ‹ṯ›. The conventional transcription indicates the consonants of a word by means of conventionalized symbols. It is important to note that the conventional consonant symbols must not be interpreted phonologically or phonemically. For more details about the conventional Egyptological transcription ☞ §2.6.

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1.2.2 Notation of Egyptian vowels

The conventional transcription, like the indigenous Egyptian scripts, fails to indicate vowels. Since vowels can be important for understanding the general phonetic development of a word, I frequently add vocalized reconstructions of Egyptian words in parentheses ( ). These are not phonological nor phonetic renderings either. Rather, the forms in parentheses are combined of consonants cited by the conventional transcription symbols on the one hand and vowels reconstructed from Coptic (a late form of Egyptian written in an alphabetic script, ☞ § 2.7) or from other sources on the other. Word stress is indicated by ' preceding the syllable as in the IPA system. If I assume a vowel to have been present at a certain position in a word but have no information on the nature of the vowel, this is indicated by the symbol V. If it is uncertain whether a vowel was present at a certain position or not, this is indicated by [V].

1.2.3 Understanding Egyptian examples in this book

Let us consider the example *nṯr* ('naṯrV) "god". The conventional transcription of the Egyptian word is *nṯr*. Note that *ṯ* is the transcription symbol for a stop which originally was /c(^{h})/ but later developed into /t(^{h})/ in this word, and *r* is the symbol for a liquid which may actually have been /l/ rather than /r/ and which was later lost altogether in this word. The consonant symbols are repeated in parentheses supplemented by the indication of the stressed vowel *a*. Although this vowel is not indicated in the Egyptian script, it can be deduced from cuneiform transcriptions as well as from the Coptic successor of the word. I assume that there was also an additional vowel at the end of the word. Since we lack evidence for the quality of this vowel, it is simply indicated by V. ('naṯrV) is an abstract representation which does not indicate the actual pronunciation of this word at any stage of the language. However the approximate pronunciation of this word at several stages can be deduced from it by applying the sound development rules which are discussed throughout this book.

In order to indicate a phonetic or phonological rendering of an Egyptian word during a specific period, the conventional consonant symbols are replaced by IPA-symbols representing their actual pronunciation, and the word is included in either brackets [ ] or slashes / / respectively.

1.2.4 Notation of Coptic

Coptic words are always cited in the original script discussed in § 2.7. I frequently add a phonological interpretation in slashes / /.

Each Coptic word is preceded by a letter in superscript which indicates the dialect from which the word is taken. For example, ^{s}ⲁⲛⲟⲕ /a'nɔk/ refers to the pronoun ⲁⲛⲟⲕ /a'nɔk/ "I" of the Sahidic dialect of Coptic. I also frequently give several dialect forms of a word

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side by side (^{s}ⲁⲛⲟⲕ /a'nɔk/, ^{a}ⲁⲛⲁⲕ /a'nak/). ^{s,b}ⲥⲟⲛ /'sɔn/ “brother” means that the word for “brother” is identical in the Sahidic and the Bohairic dialects.
The dialect abbreviations are explained at the end of § 2.3.

1.2.5 Further remarks on the citation of Egyptian and Coptic words

Egyptian-Coptic etymologies are widely used throughout this book. I will not usually cite the relevant literature if the etymology is well-established and can easily be found in the available Coptic etymological dictionaries (for these ☞ § 2.4.1). A semantic gloss always accompanies cited words, but I do not always indicate semantic changes which may have taken place in a word over time, unless this is vital for my argument.
Egyptian is an inflecting language. If not specified otherwise, nouns are usually cited in the singular form and verbs in the infinitive. Egyptian nouns, infinitives of verbs, and prepositions have special forms called status nominalis and status pronominalis which are frequently referred to in this book. They are used immediately before a noun phrase serving as possessor (in case of nouns), as direct object (in case of infinitives of transitive verbs), or as the argument of a preposition respectively. Besides the infinitive, which is the most frequently used verbal form of Coptic, verbs may also be cited in another form called stative, a form which expresses a state and frequently conveys a passive meaning.

1.2.6 Other symbols

In the Egyptological transcription, the signs (.) and (-) are employed to mark morpheme boundaries. For further explanation ☞ § 2.6.1.1.
The symbols > and < indicate diachronic relationships.
The symbol ☞ refers the reader to another section or page in this book.

1.2.7 Periods of Egyptian history

The following Egyptological terms designating periods of the Egyptian history will be used throughout the text:

Old Kingdom (OK)	Dynasties 3-6	ca. 2650-2150BC
1st Intermediate Period	Dynasties 7-10	ca. 2150-2000BC
Middle Kingdom (MK)	Dynasties 11-13	ca. 2000-1700BC
2nd Intermediate Period	Dynasties 14-17	ca. 1700-1550BC
New Kingdom (NK)	Dynasties 18-20	ca. 1550-1100BC
Late Period	Dynasties 21ff.	ca. 1100BC - 395AD
Ptolemaic Period		332-30BC
Roman Period		30BC - 395AD

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1.3 Phonemes and phonology

A phoneme is traditionally defined as the smallest meaning-differentiating phonetic unit in a language. A phoneme is distinguished from any other phoneme by one or more distinctive phonological features. All phonemes together form the phonological system of a language.

It would, however, be wrong to say that there "is" a phonological system in a language and that our task simply is to discover it. The phonological system has no existence on its own, but rather is the result of our attempts to put the innumerable data which we encounter in a language together to form an organized structure. Frequently, individual pieces of evidence suggest contradictory assumptions about the system, and our decision will then depend on how much weight opposing pieces of evidence are given. In such cases, there may be more than one correct way of constructing a phonological system, and each solution may have specific advantages. Different solutions may be preferred depending on the purpose for which the phonological analysis is undertaken.

A notorious problem of phonology arises with regard to "marginal" phonemes. These are phonemes which seem necessary to explain rare phenomena in a language, but the inclusion of which complicates the phonological system considerably. One of many examples of marginal phonemes are nasal vowels in Standard German, which are restricted to French loan words, where they are pronounced only by a part of the speakers and often inconsistently. Depending on how much weight is given to the opposing goals of completeness of the phonological description on the one hand and simplicity on the other, different decisions will be made. The choice can be different for a reference grammar of German than that for a didactic introductory text.

Another well-known example for which divergent phonological analyses are possible is the Russian *ı*-sound. Some scholars consider it a distinct phoneme, but others prefer analyzing it as an allophone of the phoneme /i/, the selection depending on the nature of the preceding consonant. Both analyses are legitimate, and each has its own advantages and disadvantages. The first analysis explains certain marginal and foreign words more easily and is in agreement with the Russian writing system. By contrast the second allows for both the positing of a smaller vowel inventory and for an elegant formulation of several morphological alternations. From a comparative perspective, the first analysis permits a better comparision with Old Church Slavonic, whereas the second analysis presents Russian as closer to certain other modern Slavic tongues.

Another notorious problem is the phonological interpretation of diphthongs in many languages, including English. As for the diphthong in words like *fine*, scholars have defended interpretations both as a single phoneme /ai/ and as a diphonemic sequence /a/ + /j/ without having reached a definite conclusion. Criteria from various fields (phonetic, distributional, morphological, dialectal, historical, etc.) can be adduced in favor of opposing analyses, and there is no simple solution as to how to weigh the different pieces of evidence. It should be concluded that both analyses are acceptable. In a description of

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English phonology, it would be legitimate to present both analyses side by side and make use of each of them for what they explain best.

Phonology is not an isolated system but rather interacts with other subsystems of the language such as the lexical, the morphological, and even the graphical level. The decision is not always straightforward as to which level of analysis a given phenomenon should be attributed. For example, marginal phonemes as described above may be completely excluded from a phonological description and may simply be discussed as peculiarities of single lexical entries. Generative phonologists frequently expand the scope of phonology in order to include phenomena that had earlier been explained within the framework of morphology (a classical example is the treatment of English phonology by Chomsky & Halle 1968). Two or more levels of phonological analysis are assumed there, which may considerably complicate the phonological description but which simplifies the morphological description of the same language. Some scholars have expanded the phonological apparatus in order to explain phonological properties of divergent dialects of a language from a single level of representation.

Thus we see that a phonological analysis is not merely concerned with the "sounds" of a language. Rather the linguist is always influenced by the conceptions he or she has of the language as a whole, including its morphology, lexicon, diatopic variation, and other levels. Within certain limits, it is legitimate and even necessary to fashion the description of one subsystem of a language with respect to a simple and economic description of the others.

Although the distinction between the phonological and the graphemic systems is indeed important and linguists have been right in emphasizing it for more than a century, I therefore argue that it would be wrong to reject the possibility that in certain cases a phonological analysis may be given preference to another simply because it allows for an easier connection to the writing system.

1.4 Peculiarities of a phonological analysis of Egyptian as an extinct language

Although Ancient Egyptian is essentially attested as a written language, it is useful to assume a phonological level of analysis for it, as is indeed done for any other extinct tongue. If we had no conceptions whatsoever about Egyptian pronunciation, i.e. if the phonetic character of the Egyptian script was not known, we would have immense difficulties both in recognizing or interpreting writing variation within the Egyptian script itself, and in identifying Egyptian words recorded in other writing systems (Greek-Coptic, cuneiform, Hebrew, etc.). The identification of (earlier) Egyptian with Coptic words has always been one of the major techniques of exploring the language. Already the first decipherers did not therefore restrict themselves to simply determining the meaning of words, but also concerned themselves much with the pronunciation of the words.

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However the types of evidence used to construct a phonological system of Egyptian have different relative importance than in modern languages. In Egyptian, the graphic representation, which – as I argued above – can legitimately have a limited influence on a phonological analysis, is given more weight than would be the case with a living language. Whereas modern languages are often analysed on a strictly synchronic level – although even essentially synchronic and generative treatments sometimes include historical considerations –, we also have to pay more attention to the relationship of different diachronic stages of the language in the case of Egyptian. Since practically everyone who deals with Egyptian is concerned with texts composed during different historical periods, being able to diachronically connect the elements of the language is more important than knowing the most efficient phonological analysis of a given synchronic stage.

I hope that although the phonological analyses suggested in this book are necessarily deficient and peculiar in many respects, they are still useful in explaining much of the available evidence. On the one hand, there is no question that our phonological analysis of Egyptian is underdifferentiated in many respects. On the other hand, this defectiveness may lead us to overdifferentiate certain points of a phonological system by failing to recognize the presence of conditioning environments. Instead of being interpreted as phonemic, any difference found can technically also be described as allophonic if we postulate that the conditioning environment has escaped our attention. To take an example, if I have decided to assume a phonological distinction between two consonants /p/ and /b/, this distinction best conforms with the evidence that is presently available (e.g. etymological connections between different stages of Egyptian, borrowing of Egyptian words into other languages, evidence of the Egyptian writing system). It is possible that, for instance, Egyptian had a hitherto unknown tonal system, which if taken into consideration would allow for *p* and *b* to be analysed as mere allophones of a single phoneme /P/, the choice between both allophones depending on the tone of an accompanying vowel. This uncertainty is, however, not a peculiarity of Egyptian alone since, as exemplified above, even in well documented modern languages there may be more than one acceptable analysis of a given phonological issue.

If evidence of Egyptian as a spoken language suddenly became available, certain analyses would then have to be preferred which cannot be favored with the present knowledge, whereas some analyses of today would then appear less preferable. However, this discovery would not imply that the traditional analysis and all conclusions based on it are simply wrong. For example, the statement that the Coptic successors of *p* and *b* merge in a certain environment (☞ § 3.12.4) could still be maintained in the new analysis after some reformulation. Furthermore, even the discovery of a tonal system as outlined above would not force us to give up the old phonological distinction of /p/ and /b/, if instead the tonal system was analysed as allophonic.

I conclude that the restricted knowledge of Egyptian still allows for a rudimentary phonological analysis, certainly one which is less refined than it can be for a living language, though not of a principally different character.

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1.5 The Neogrammarian's principles and diachronic phonology

Any work in etymology involves two linguistic levels. Words are compared both according to their phonetic and to their semantic properties. Whereas the semantic side of an equation still has to be evaluated largely by intuition, it has been possible to formally control the phonetic side of etymologizing since the end of the 19th century when the Neogrammarians developed the famous principle of the regularity of sound change. Although historical linguists tend to accept limited deviations from this principle for etymologies which seem very convincing in the semantic respect, the Neogrammarian's approach has been accepted as essential for any work in historical linguistics and is also adopted in this book.

The principles of historical linguistics allow us to make predictions about a language based on evidence from successor languages (which can also be called later stages of the same language). This method can be applied if there is only one successor language, but it is more efficient if the language has split into several daughter languages. The more daughter languages are known, i.e. the more data are available for the input, the more detailed the reconstruction will be.

There is no fundamental difference between what is called a "genetic relationship" on the one hand and language contact on the other. It would be normal to make predictions about Latin based on the examination of the genetically derived Romance languages, but we could also attempt to reconstruct the Latin sound system if the only extant evidence consisted of borrowings from Latin into Albanian, Basque, and Berber. Both methods are equally acceptable from a methodological point of view, only the amount of data is smaller in the latter case.

The Neogrammarians' principles were formulated when scholars did not yet make a difference between phonetics and phonology, and indeed their principles need not necessarily be applied to phonemes, but can be applied to units singled out by any method of phonetic differentiation. However, if the differentiation on the input side is rough, the result will be no better. This question has been adressed by Holzer (1996) whom I cite in the original here:

> "Die phonologische Klassifizierung – in erster Linie nach dem Kriterium der Fähigkeit bzw. Unfähigkeit eines Lautungsunterschiedes, Bedeutungen zu unterscheiden – ist bloß eine Möglichkeit unter anderen, lautliche Größen als gleich oder verschieden zu betrachten (...). Nach welchen Kriterien man auch abstrahiert und klassifiziert, mit den unterschiedenen lautlichen Größen können immer Lautgesetze formuliert werden, wo reiner Lautwandel gewirkt hat. Unterscheidet man nruss. [*neurussisch, C. Peust*] *i* und *y* (es sind verschiedene Laute), muß man formulieren: aruss. *i* z.B. nach *t* > nruss. *i*; aruss. *i* z.B. nach *š* > nruss. *y*; aruss. *y* z.B. nach *t* > nruss. *y*; aruss. *y* z.B. nach *k* > nruss. *i*. Unterscheidet man nruss. *i* und *y* hingegen nicht (sie gehören demselben Phonem /i/ an), genügt einfach: aruss. /i/ und /y/ > nruss. /i/." (Holzer 1996: 88)

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> “Man könnte auch mykenisch-griechische Wörter, wie sie in Linear B geschrieben wurden, also (abgesehen von *t* vs. *d*) ohne Unterscheidung zwischen Tenues, Mediae und Aspiratae, mit altindischen zusammenstellen und so ein gültiges Rekonstrukt des Urindogermanischen bilden (...)” (Holzer 1996: 119f.)

For comparative research in fields like Indo-European, Dravidian, or Sino-Tibetic, well-founded descriptions of both the phonology and the semantics of living languages are available. Speculation is therefore limited to constructing the proto-language as the other side of comparison. In Egyptian, the situation is both better and worse at the same time.

All stages of Egyptian are evidenced to an imperfect degree, and many aspects of the language escape our attention completely or can only be used with reservations due to our limitation of knowledge. We can hear Egyptian words and ask speakers about their meaning only in a few cases when Egyptian words have been borrowed into other languages (especially, but not exclusively, into modern Egyptian Arabic). In principle there is no difference between the preservation of an Old Egyptian word as a loan in English (*ḏb.t* “brick” > *adobe*) and that of a Latin word in modern Italian. In both cases, the words are “genetically” related and were formally modified by regular sound changes. But those fragmented data cannot give us a coherent picture of the language, anything that could reasonably be called a system.

However, there are also advantages specific to Egyptian, namely the fact that this language was recorded by native speakers for about four and a half thousand years. During this time, very considerable changes on all linguistic levels, including the phonological level, took place. We can use evidence from later stages of the language for establishing reconstructions of an earlier stage which is also attested in its turn. The attested language history is long enough to provide us with numerous interesting phonological developments without ever having to refer to a (re)constructed proto-language. This is not to say that we could avoid (re)constructions as such, but everything we assume can be compared and cross-checked against data produced by native speakers.

1.6 Refining a synchronic phonological analysis by diachronic evidence

The methods of historical linguistics are frequently applied in order to reconstruct an unattested language, for instance Proto-Indo-European. However we can also apply them to an attested language to get more information about it than we would derive from a synchronic evaluation of the written sources alone. For example, the Latin orthography does not note vowel length, but this feature can be reconstructed for the most part from a comparative analysis of the Romance daughter languages (another source is the examination of Latin metrical texts). In the earliest sources of Akkadian (Old-Akkadian) the

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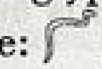
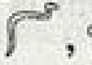
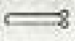
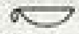
three series of plosives (voiceless, voiced, emphatic) are not distinguished in writing, but the difference is inferred from the evidence of later texts when the script had become more refined (as well as from Semitic etymology). Old Turkish is written in several scripts all of which ignore certain phonological distinctions of this language. Therefore the comparison to modern Turkish languages plays an important role in reconstructing Old Turkish phonology. The sound values of the signs in Old Chinese are largely reconstructed on the basis of modern Chinese dialects. The same principle is applied throughout this book where the evidence of the hieroglyphic script is supplemented by reconstructions based on the later testimonies of the Coptic dialects.

Predictions that can already be made from the comparative evidence of Coptic dialects are frequently confirmed by evidence attested from the pharaonic language. To take an example, there are two graphs (ϫ, ϭ) for palatal stops in Coptic. Two dialects known as Sahidic and Bohairic behave differently in writing a given palatal stop in a word, so we can establish four sets of correspondence for rendering the palatal stops:

	set 1	set 2	set 3	set 4
Sahidic	ϫ	ϫ	ϭ	ϭ
Bohairic	ϫ	ϭ	ϫ	ϭ

The Neogrammarian's principles predict here that, unless a specific environment can be found that could have caused a split development, (at least) four different sounds must be assumed for some earlier stage of the language. Indeed, the etymological cognates from hieroglyphic Egyptian show four graphemes which correspond to the four sets established here: , , , and .[2] This comparison works regardless of the view taken about the nature of the Coptic dialects; the possible conclusions may differ, though. For instance, if we take the two "dialects" to represent mere alternative orthographical conventions, (at least) four different palatal stops will have to be posited for spoken Coptic as a whole, homography being differently applied in each writing convention. If, on the other hand, the dialects are perceived in a more traditional sense, it is possible to assume different sound mergers in different parts of the country. Whatever scenario is accepted, we can reasonably reconstruct four sounds for the earlier language. Furthermore, we can argue that there is a common feature linking the sounds represented by sets 1 and 2, as opposed to the sounds represented by sets 3 and 4, and another feature linking sets 1 and 3 as opposed to sets 2 and 4. These features common to two sets each would have motivated the phonetic merger or the homography respectively.

If the examination of later stages of Egyptian leads us to postulate distinctions for the earlier language, they should in principle be reconstructed even if there is no direct confirmation for them from that period. In this case, they serve to refine our picture of the

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[2] The presentation is simplified here. Note particularly the fact that in Bohairic the opposition of both stops is maintained only before the stressed vowel (☞ § 3.3.2) which renders the Egypto-Coptic relationships somewhat more complex.

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earlier language and help us to get insight into what is hidden by deficiencies of the writing system. For example, vowels are generally not indicated in the hieroglyphic script, but we postulate many of them by the evidence of Coptic. In this book, I also suggest some consonantal distinctions based on reconstructions from Coptic which fail to be indicated in the Egyptian script.

1.7 Phonemic versus graphemic representation

Although phonetic data most naturally provide a major base for researching the phonology of a language, in the case of Egyptian we have to rely mainly on written sources. Any phonographic writing system actually implies a categorization of speech sounds, although this may be quite different from what we would call a phonological analysis. However, the written evidence can be taken as a starting point for the analysis of the sound system. This analysis can be refined if more data, such as renderings of the same language in different writing systems, or evidence from other diachronic stages of the language, or typological predictions about the structure and development of phonological systems in general are included.

In addition to the straightforward case of an unambiguous correspondence of graphemes and phonemes, more complex patterns of correspondence are possible. Let us take a look at two fundamental patterns here which often occur in languages:

A) Two or more graphemes correspond to one phoneme: the graphemic system is more differentiated than the phonological system.

Not all graphemes have a phonetic function whatsoever. Even if a sign is definitely used in a phonographic way, its function may include further semantic or grammatical components (cf. the difference between small and capital letters in the Latin script). What we face here is the problem of distinguishing phonographical and semographical sign functions.

Let us assume a set of graphemes which we believe to be phonographs, i.e. for which no semographic functions are obvious. Phonographs may express phonetic differences of any kind, not necessarily phonological differences. If only an allophonic distinction is expressed, we may be able to find specific environments by which the allophones are conditioned. In other words, if we observe that a certain grapheme is always used in a specific phonetic environment, a possible explanation is that this grapheme denotes an allophone rather than a phoneme. However, we can only observe this if the conditioning environment itself is expressed in writing.

Some phonographs may be consistently kept distinct from one another but some may not. If a former phonetic distinction is eliminated through language change, the corresponding graphemes will become homophones. In this case, we typically observe that the graphical distinction is no longer retained with any consequence, especially in texts ranging on a low sociohierarchical scale. There is a good chance that in the long run one of these

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graphemes will be eliminated from the writing system, or the difference will be reinterpreted to express another functional distinction.

B) Two or more phonemes correspond to one grapheme: the graphemic system is less differentiated than the phonological system.

It seems to be a universal that the phonological level is mirrored into the graphemic level defectively. For instance, intonational properties are not rendered adequately in any writing system. Additionally, the Egyptian scripts dispense with rendering vowels.
This problem can partly be remedied by correlating two or more graphical systems with one another. This can be done from a diachronic perspective (renderings of different stages of a language) as discussed in § 1.6, but also from a synchronic perspective (renderings of the same language in different writing systems). For example, the hieratic and the cuneiform representations of Late Egyptian together tell us more than each of them would do alone.
In some cases distinctions which have been posited by such stipulations can be corroborated by extralinguistic information. For example, in § 3.7 I posit two different Egyptian phonemes hidden behind the single grapheme ‹q›, since the corresponding sounds end up as both velar and palatal stops in Coptic, and no different environments are recognizable that could have induced allophones or a phonemic split. One of these phonemes occurs in borrowings from Semitic languages only. So we can suggest that by language contact a new phoneme was imported into Egyptian but no distinct grapheme for its representation was created.

An amount of uncertainty always remains. It is possible and actually to be expected that some phonological traits are not reflected in the graphemic represention of any stage of the language and will therefore remain obscure forever. On the other hand, failing to recognize certain distinctions may lead us to assume phonological differences in other parts of the phonemic system which we would better not assume if we had direct access to the spoken language.

I have only discussed here the different representations of small linguistic elements (phonemes, graphemes) in spoken and written Egyptian respectively. Kammerzell (1991c, 1992/93, 1998a: 21-23) makes it clear that spoken Egyptian ("Phonemsprache") and written Egyptian ("Graphemsprache") can actually be considered two distinct linguistic systems since they show marked differences on all levels of linguistic description including morphology, syntax, and pragmatics. It is a striking fact that spoken Egyptian was a highly inflectional language, whereas written Egyptian can be described as a basically agglutinative system.

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1.8 A short history of research in Egyptian phonology

Studies in the Egyptian language have always had a strong diachronic bias. This is understandable when we consider the immense history of Egyptian. Furthermore, the analysis of a given element at a given time can frequently only be stipulated from evidence of other periods. This is especially true for the fields of lexicography and phonology.

Beginning with Jean François Champollion who deciphered the hieroglyphs in 1822, the first Egyptologists identified numerous hieroglyphic groups with words of Coptic which was already well known at that time, but they were not yet fully aware of the differences between Egyptian and Coptic as languages. When the linguistic distance between both languages became more and more evident, extensive research on Egyptian phonetics began. Much of this early work is no longer acceptable today and will not be discussed in this book.

At the end of the 19th century, the so-called Berlin school, with Erman, Sethe, and Steindorff as its leading figures, made major progresses in distinguishing between the diachronic stages of the Egyptian language, which was a crucial precondition for further research. What followed were milestones in Egyptian linguistics such as the recognition of the principally consonantal nature of the Egyptian writing system (Brugsch & Erman 1889), the discovery of the syllable structure rules (in Steindorff 1894), and the monumental and still invaluable "Verbum" by Sethe (1899-1902) in which numerous exact definitions of Egyptian phonetic developments by the Neogrammarian's model were proposed. The recovery of additional important sources (new Coptic dialects, cuneiform transcriptions of Egyptian) led to better insights into the vowel system (Sethe 1923). (For more details on the history of these discoveries see Zunke 1997: xvi-xx.) The first etymological dictionary of Coptic was published by Spiegelberg (1921). Based on these materials, two monographs on Egypto-Coptic sounds appeared in which the knowledge of that time was codified (Czermak 1931/34, Worrell 1934).

Vergote (1945) was the first scholar to apply the distinction between phonetics and phonology to Egyptian, which increased the clarity and exactitude of the analysis. More detailed and more modern phonological investigations into certain domains followed (e.g. Satzinger 1979, Hintze 1980). Other scholars, although based on a more traditional methodology, also expanded our knowledge considerably (e.g. Edel, Fecht, Lacau, Osing, Vycichl). In the light of the new developments, the possibilities for estimating Egypto-Coptic etymologies increased greatly. Three new etymological dictionaries of Coptic appeared in a quick sequence (Westendorf 1965/77, Černý 1976, Vycichl 1983).

Meanwhile, scholars from outside Egyptology had provided essential contributions to Egyptian (Greenberg 1962; Hodge 1966; Rössler 1971) which only slowly made their way into Egyptology. New evidence such as the consonantal compatibility restrictions was discovered, and scholars began to question crucial traditional assumptions. Today there is vivid research on Egypto-Coptic phonology by several scholars such as Depuydt, Hodge, Kammerzell, Kasser, Loprieno, Satzinger, Schenkel, and Zeidler, to name only some.

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2 Basic information about Egyptian

2.1 Diachronic stages of the Egyptian language

On the history of the Egyptian language in general see Junge (1984b), Jansen-Winkeln (1995), and Kammerzell (1998b: 59-78) where further references can be found.
We can divide the history of the Egyptian language into the following stages:

2.1.1 Ca. 3100–1300BC: a single written language

The first testimonies of script in Egypt are attested from the late 4th millennium BC.[3] The earliest documents are usually very short and consist of isolated names and nouns most of which technically cannot be clearly attributed to a specific language. Already from Dynasty 3 (around 2600BC), several longer texts are known.[4]
Until approximately 1300BC, basically one language was used for all purposes of writing. It can be subdivided into two stages: Old Egyptian (until ca. 2000BC) and Middle Egyptian (from ca. 2000BC on). It is difficult to estimate how much spoken and written language differed from another at that time. From the late 3rd millennium on, we know a very limited number of textual sources from informal, everyday contexts which show grammatical peculiarities reminiscent of Late Egyptian. This suggests that by this time a marked diastratic variation already existed.[5]

2.1.2 Ca. 1300–500BC: differentiation into two written languages

From about 1300BC on, remarkable linguistic differences can be observed on the synchronic level.[6] Texts can either be written in a somewhat archaic language based on Middle Egyptian, or in a more informal language which probably reflects the contemporary spoken tongue. The former is called Neo-Middle Egyptian, the latter Late Egyptian. The gap between (Neo-)Middle Egyptian and Late Egyptian is considerable in both the grammatical and the lexical respects so as to justify a classification as two different languages. Many texts, especially those dating from 1300 to 1000BC, show various degrees of mixture between both linguistic systems. After about 1000BC, the two codes tend to be kept apart more strictly. It is possible that the

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[3] On the beginning of script in Egypt see Dreyer (in print) and Engel (1997).

[4] On the texts from Dynasty 3 see Kahl & Kloth & Zimmermann (1995).

[5] E.g. the definite article *pꜣ* which is a typical Late Egyptian feature is already found a few times in the late Old Kingdom, but only in utterances ascribed to lower class people and as parts of proper names (Fecht 1960: § 415).

[6] The development of two Egyptian written languages is treated in detail by Jansen-Winkeln (1995).

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phonological systems of both styles had become differentiated (only) by this time, as Jansen-Winkeln (1995: 106) suggests.

Both linguistic varieties appear to have had a different prestige, and their use depended on the given text genre to a certain degree. "Classical" Middle Egyptian with its wealth of literature and religious tradition continued to be learned in schools, and new texts, especially with religious content, were still composed in this language. Late Egyptian, on the other hand, was the language of administration, economic transactions, private use, and many literary texts were composed in this idiom.

The official correspondence of New Kingdom Egypt with its Asian provinces was recorded in Akkadian, a Semitic language written in cuneiform which some Egyptian scribes were taught as a foreign language.

2.1.3 Ca. 500BC – 250AD: three written languages

In 525BC Egypt became part of the Persian empire. From this time forth, the language of foreign rulers replaced Egyptian as the means of expression within the higher administration. This was Aramaic under the Persians and Greek under the Ptolemies and Romans.

The main spoken language of Egypt was called Demotic ("popular [language]") by the ancient Greeks, a term still employed today. It was written in a distinct script, likewise called Demotic, which is a development from hieratic. Demotic was used as the means of writing for a variety of purposes, ranging from private notes to official administrative texts.

In Roman times, the position of Greek became stronger. From about 50AD, most literate Egyptians employed Greek as the means of writing in preference to Demotic (Bagnall 1993: 237). The "classical" Neo-Middle Egyptian language was still in use mainly for religious purposes, but its knowledge became more and more restricted to small circles of priests.

Already in Ptolemaic times, attempts began to employ Greek letters for writing texts in the Egyptian language. An important early example is the inscription of Hurgonaphor, an ephemerous provincial king in Upper Egypt, from 202/1BC. This text appears to be written with Greek letters throughout, but is only partly understandable.[7] From the 1st/2nd century AD on such texts become more frequent, although most of them are restricted to specialized contexts (magical, astrological). Usually, such texts are not exclusively written with Greek letters, but show various degrees of admixture of Demotic phonographical and logographical signs. Texts written this way are called "Old Coptic".[8]

The language of most Old Coptic texts seems to be identical to Demotic. However, Osing (1976c) published a text from the 2nd century AD, written in a mixture of Greek and

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[7] The text has been edited by Pestman (1977: no. 11). For its date see Vandorpe (1986: 300). For similar texts from this period see Quaegebeur (1991b).

[8] For an overview of Old Coptic sources see Satzinger (1991b).

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Demotic signs, which seems to be composed basically in a form of Neo-Middle Egyptian. This text is very difficult to understand.

2.1.4 Ca. 250 – 1700(?)AD: two/three written languages

As a part of the Roman empire, Egypt gradually became a Christian country. Classicistic Neo-Middle Egyptian, together with the hieroglyphic script, which had become restricted to use within the pagan religion, were forgotten. The last known hieroglyphic text dates to 394AD (Griffith 1935/37: vol. 1, 126f. and vol. 2, pl. 69). At approximately the same time, the popular language ceased to be written in Demotic script, the last known recording dating to 452AD (Pestman 1967: 127). During the late period of hieroglyphic history, an increasing number of pseudo-hieroglyphic inscriptions had appeared (on these see Sternberg el-Hotabi 1994).

Based on the first attempts to write Egyptian in Greek letters ("Old Coptic", ☞ above), the so-called Coptic alphabet was developed (on the Coptic alphabet ☞ § 2.7). Egyptian written in this alphabet is conventionally called "Coptic" by modern scholars. Coptic came into full use around 300AD, when major portions of the Bible were translated into this language.[9] At this point the native language of Egypt began to flourish again as a means of writing during the next couple of centuries, although Greek continued to be used as an administrative language far into the Islamic period. Coptic is attested in several dialects (on which ☞ § 2.3).

In 640AD, the Arabs occupied Egypt. They imported a new religion, Islam, as well as their own language and script. Very slowly, Arabic began to supersede Coptic as a means of writing. The last major newly-composed text in Coptic seems to be the Triadon, a long religious poem written in the Sahidic dialect around 1322AD.[10] Finally, at a date which is difficult to determine (☞ § 2.2.1), Coptic became extinct also as a spoken language. Some knowledge of Greek was preserved among the remaining Christians alongside with the knowledge of Coptic, since many Christian liturgical texts were written and recited in Greek.

2.1.5 Modern time

Today the Egyptian Arabic dialect is the means of communication among the vast majority of the population of Egypt. The sole means of writing is Modern Standard Arabic which diverges from the spoken language to a considerable degree. This is a typical case of diglossia. Arabic is also in use among the remaining perhaps eight million Christian inhabitants. They, however, continue to employ the Coptic and Greek languages for

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[9] For the date of the Bible translation cf. Kahle (1954: I, 269-272).

[10] The text was published by von Lemm (1903) and translated by Nagel (1983). For its date see Nagel (1983: 22f.).

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liturgical purposes, although most of them understand little or nothing of these texts. The role of Coptic among modern Christian Egyptians is thus comparable to the role of Latin in the Catholic church.

2.1.6 Synopsis

	preferred spoken language	written language preferred for personal correspondence and lower administration	written language preferred for higher administration	written language preferred for religious texts
3100–1300BC	probably varieties close to Old and Middle Egyptian	Old and Middle Egyptian	Old and Middle Egyptian	Old and Middle Egyptian
1300–500BC	probably varieties close to Late Egyptian	Late Egyptian	basically Late Egyptian	Neo-Middle Egyptian
500BC–50AD	Demotic	Demotic	Aramaic, Greek, Demotic	Neo-Middle Egyptian
50-250AD	Demotic	Greek	Greek	Neo-Middle Egyptian
250–700AD	Coptic	Coptic, Greek	Greek	Coptic, Greek
700AD–1400AD (Christians)	Coptic, vernacular Arabic	Coptic, standard Arabic	standard Arabic	Coptic, Greek
1400–1700(?)AD (Christians)	vernacular Arabic, late varieties of Coptic	standard Arabic	standard Arabic	Coptic, Greek, standard Arabic
today (Christians)	vernacular Arabic	standard Arabic	standard Arabic	Coptic, Greek, standard Arabic
700AD–today (Muslims)	vernacular Arabic	standard Arabic	standard Arabic	standard Arabic

2.2 Late Coptic

Coptic finally became extinct as a spoken language but continues to be used as a liturgical language of the Coptic church until the present day. Even when Coptic was no longer in productive written use, it still experienced major phonetic developments (☞ §§ 3.3.8 and 5.5.6). On the records about late pronunciation traditions ☞ appendix 7.

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2.2.1 The disappearance of Coptic as a spoken language

Coptic remained in productive written use until about the 14th century AD. It is difficult, however, to determine the time at which Coptic became extinct as a spoken language, but it is generally agreed that Coptic was preserved longest in Upper Egypt. O'Leary (1934: 243-249) assumes that Coptic had already ceased to be in spoken use in the 13/14th centuries AD.[11] Certain sources which, however, are of questionable reliability suggest that Coptic was still spoken in the 17th century[12]. The existence of a trilingual Gəʿəz (Ethiopic) – Arabic – Coptic glossary of everyday vocabulary which is assigned to approximately the early 18th century AD (☞ §2.9.3) seems to indicate that Coptic was still useful to know at that time.

Quibell (1901: 87) states that he had heard that "30 years ago" there were still elderly people around Qus and Naqada in Upper Egypt who remembered that they had heard Coptic spoken in their youth. This would have been approximately at the beginning of the 19th century. It is unclear how trustworthy these testimonies are.

There were a few elderly inhabitants of the Upper Egyptian village *iz-Zēnīya* that also bears a Coptic name *bi-Sulsāl* (= *ⲠⲒ-ⲤⲞⲖⲤⲈⲖ) who claimed that, although they themselves were no longer fluent in Coptic, they had still heard their parents speak it as a living tongue while they were in their youth. When Werner Vycichl was informed of this in the mid 1930s, he visited these people in order to record what they still had in their memories. Unfortunately, he told us nothing about the technique of inquiry by which he collected the materials. The results were published in Vycichl (1936), Worrell (1937), and Worrell & Vycichl (1942). A rather mysterious remark by Till (1954: 156), however, has cast doubt on the credibility of Vycichl's recordings.[13] Cf. also the comments by Jozef Vergote in Legrain (1945: 124-126) on an inhabitant of the same village who was shown to have faked that he still had a command of Coptic.

In modern Egypt, there are a few enthusiasts who are trying to revive Bohairic Coptic as a living language.[14] For this purpose, booklets are written which attempt to teach spoken Coptic for modern everyday use (e.g. Ishaq 1972).

2.2.2 Coptic as a language of liturgy in modern Egypt

From the 9th century on, the (originally northern) Bohairic dialect became the prevalent

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[11] Cf. also Simon (1936).

[12] Cf. Vergote (1973/ 83: Ia, § 1).

[13] "Über die Angelegenheit der «koptisch sprechenden Familien» in Zeniya gibt es an massgebender Stelle eine völlig andere Ansicht. Es wäre mit Rücksicht auf die Wichtigkeit dieser Frage sehr wünschenswert, wenn diese einmal geäussert würde, so dass die wissenschaftliche Welt darin nicht einseitig orientiert bleibt." To the best of my knowledge, this opinion has not been expressed by now.

[14] On this topic cf. Ishaq (1993).

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literary variety of Coptic throughout Egypt because the center of Coptic culture was situated in the north-west of the country (Alexandria was the residence of the Coptic patriarch, the monasteries of the Wādī 'n-Naṭrūn were major sites of book production). Bohairic is the dialect in which all Coptic liturgical texts have been written from medieval times until today. Local traditions about the pronunciation have been largely superseded by the Bohairic dialect propagated by the Coptic church. Traces of other dialects can, however, be found in the onomastic material (see Vycichl 1936: 170). For example, the modern name of the town /ʔax'mi:m/ in middle Egypt < Egyptian *ḫnty-mnw* lacks the palatalization ‹ḫ› /x/ > /ʃ/ (cf. Sahidic/ Bohairic ϢⲘⲒⲚ) and can only be explained from the Akhmimic dialect of the Coptic language where /x/ was regularly preserved (☞ § 3.8.4).

Patriarch Cyrillus IV (1854-1861) introduced another change in the way liturgical texts are read. He inaugurated a so-called "reformed pronunciation" of the Coptic letters which is modelled on the pronunciation the equivalent letters have in Modern Greek. This reformed pronunciation is prevalent among Copts in Modern Egypt.

Coptic loans and place names which were taken over into modern Arabic nowadays fit into the phonological system of the Arabic vernacular, and there are no phonological or phonetic traits specific to them. However, the case might have been different with older habits of pronouncing Coptic liturgical texts. Prince (1902: 291) emphasizes the phonetic peculiarity of the Coptic liturgical pronounciation of his days:

> "In spite of the ignorance of the priesthood, they have for ceremonial reasons been at great pains to hand down the traditionally correct pronunciation of their religious language. Indeed, so different to the intonation of Arabic is the tone of the Coptic as uttered by the priests of to-day that no one can reasonably assert that Arabic has had any influence on the pronunciation of the church language."

Sobhy (1915: 15) makes a somewhat ambiguous statement on the pronunciation of Coptic liturgies:

> "I believe that an ordinary uneducated priest [...] has the inherent power of forming the sounds of the different characters in the language of his forefathers. Indeed he pronounces the Arabic language itself as if it were Coptic. Often and often this fact struck me while I was at Church, standing at a distance from the officiating priest, when it was impossible for me – and I believe for many others – to decide whether he was chanting in Arabic or in Coptic."

It is unclear whether what struck these authors was the presence of specifically Coptic sounds, or simply the absence of typically Arabic sounds in the Coptic recitations. In § 3.12.5 I discuss evidence which seems to indicate that Late Coptic indeed retained a specific pronunciation /β/, unfamiliar to Arabic, of the letter ⲃ until quite recently. But this sound has ultimately been replaced by /w/ in the modern liturgical pronunciation of Coptic in Egypt.

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2.3 Dialects

When variation within a language is encountered, there are several possibilities of interpreting it, e.g. as diachronic variation (different historical stages of one language), diastratic variation (variation due to different social milieus), or diatopic variation (variation across different geographical regions). The latter type is what is usually understood by 'dialectal' variation. If variation is found in texts of an extinct language, it is not always immediately clear which interpretation should be preferred.

Diachronic and diastratic variation of Pre-Coptic Egyptian is well known (☞ § 2.1). The diachronic aspect is particularly easy to verify since many Egyptian texts can be assigned to an exact date. By contrast, it has been almost impossible to find clear linguistic characteristics typical for a specific geographical region, i.e. for dialects proper.[15]

The only example of a distinct Pre-Coptic dialect the texts of which originate from a restricted area is Napatan Egyptian. This variety is attested by royal inscriptions of the Napatan empire, which covered the northern half of modern Sudan, dating from the 5th to the 3rd century BC. These texts show marked deviations from contemporaneous texts written in Egypt especially with regards to syntax and morphology. It is, however, not clear whether the Napatan idiom was ever used as a spoken language or was only used as a medium of writing by speakers of other languages for which no writing system had been established. On Napatan Egyptian see Peust (1999).

The situation is quite different with Coptic. Coptic is attested in several varieties which cannot be projected on a diacronic line. These varieties, conventionally called "dialects", may reflect actual regional linguistic variations, or merely distinct methods

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[15] A few rather limited peculiarities of certain texts were explained as dialectal features by Roquet (1979, Old Egyptian), Groll (1984 and 1987, Late Egyptian), Lexa (1934 and 1949: I, §182-191, Demotic), and Johnson (1976, Demotic).
Some scholars have posited different Egyptian dialects in order to explain certain phonetic developments which are supposedly inexplicable by regular sound laws (e.g. Fecht 1960: 246, Loprieno 1995: 31, Vycichl 1990: 111f.).
Several scholars have suggested that the attested diachronic stages are additionally or essentially diatopic in nature, assuming that the standard variety of the language was rooted in different parts of Egypt through the times. The following localizations of the standard variety for specific periods have been proposed: Old and Late Egyptian in Lower Egypt, Middle Egyptian in Upper Egypt (Edgerton 1951: 11f.); Old and Middle Egyptian in Lower Egypt, Late Egyptian in Upper Egypt (Grapow 1944: 209, 211f.; Fecht 1960: 161f., 206-208); earliest Egyptian and Late Egyptian in Upper Egypt, [later] Old Egyptian and Middle Egyptian in Lower Egypt (Edel 1955/64: I, §21f.; Greenberg 1986: 284; Schenkel 1993: 148); Old Egyptian and Demotic in Middle Egypt, Middle Egyptian in Lower Egypt, Late Egyptian in Upper Egypt (Davis 1973: 202); Old and Middle Egyptian in Middle Egypt, Earliest Egyptian and Late Egyptian in (an)other area(s) of unknown localization (Satzinger 1994a: 202-204).

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of rendering the spoken language into a graphical code. Differences similar to those known from the Coptic dialects can already be observed in Greek transcriptions of Egyptian words from somewhat earlier date (Quaegebeur 1974: 418-420).

It is difficult to assign the Coptic "dialects" to specific geographical areas. This is partly due to the fact that most Coptic texts are of unknown geographical origin. But even where the origin is certain, it appears that texts belonging to one dialect can be found in different parts of Egypt. A summary of the major attempts at localising the Coptic dialects is given by Kasser (1991e).

Some scholars such as Mink (1972: 187), Kasser (1973: 71f.), and Brunsch (1978: 69) have mentioned the possibility that a graphic divergence between Coptic dialects does not necessarily render a difference in pronunciation. Hintze (1980) presents a pan-dialectal phonological analysis of Coptic which makes use of an abstract underlying phonological representation. He demonstrates for several words that it is possible to derive the surface structures of different dialects from a single underlying representation ("systematische phonematische Repräsentation", Hintze 1980: 75) if distinct sets of transformation rules specific to each dialect are assumed.[16] These underlying representations are often strikingly similar to historically preceding stages of the Egyptian language.[17]

Impressed by Hintze's account, Loprieno (1982) suggests that what are conventionally called Coptic dialects do not actually indicate any linguistic variation but rather mere various orthographic traditions for rendering a uniform language. Loprieno deserves the merit of having renounced a simplistic identification of graphemics and phonemics which many scholars have been applying too easily. Loprieno's account can, however, only explain graphic differences among the Coptic dialects. In addition to these, the Coptic dialects also provide clear examples of lexical peculiarities. Lexical variety among the Coptic dialects has not yet been researched systematically; I have collected some examples in appendix 10. Differences on the levels of morphology and syntax are scarcer, but do likewise exist.[18]

We can thus conclude that the differences between the Coptic "dialects" may be of merely graphical nature to a large part, but at least to a certain degree they witness actual linguistic variation which cannot be interpreted as diachronic and is likely to have a geographical background.

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16 Hintze's essay deals with three dialects. The rules are listed in Hintze (1980: 55-57), illustrations of how they operate follow on the subsequent pages.

17 This phenomenon is discussed by Hintze (1980: 67f.)

18 For morphological differences see Till (1961). Note that most, but not all of these differences can be reduced to mere graphic differences. For dialectal differences in syntax and morphosyntax see Polotsky (1960: 401, no. 20) and Shisha-Halevy (1981).

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The major dialects of Coptic are the following:

- Sahidic, the dialect in which most known Coptic texts are written. Soon after the Bible (or at least major parts of it) had been translated into Sahidic, which is assumed to have happened roughly around 300AD (cf. Kahle 1954: I, 269-272), this dialect became the most widespread variety of Coptic throughout Egypt. Sahidic thus contributed to the marginalization or elimination of most other dialects during the following centuries. Beginning in the 9th century, Sahidic was subsequently challenged by Bohairic which in turn spread as a literary dialect over Egypt as a whole. Sahidic is, however, attested as late as the 14th century. Since Sahidic is only known from a time when it was of superregional significance, it is difficult to assign it to any geographically determined area.
  Whereas the preserved texts of all other Coptic dialects are, with a few exceptions, translations of literary texts (mostly religious in content) from the Greek, Sahidic is the only dialect which also possesses a considerable corpus of original literature[19] and of non-literary texts. The latter frequently show certain deviations from "standard" Sahidic.
- Bohairic. Although a few Bohairic manuscripts already appear in the 4th century AD, most texts of this well attested dialect date to a relatively late era (from the 9th century on). Bohairic is the official liturgical language of today's Coptic church (☞ § 2.2). It is generally believed that Bohairic originated from Northern Egypt. Although this is a late dialect, it shows several archaic features in terms of lexicon, phonology, and morphosyntax which are not found elsewhere.
- Akhmimic. The Akhmimic texts mainly date to back to the 4th and 5th centuries AD. Subsequently, Akhmimic became extinct, at least as a vehicle of written communication. Akhmimic is believed to have been localized in the southern part of Egypt. Its name is derived from the town of Akhmim close to which some texts written in this variety were found. The retention of the phoneme /x/ in the toponym "Akhmim" itself is a typical Akhmimic characteristic (☞ § 2.2). Akhmimic is considered the phonetically most archaic of the Coptic dialects.
- Lycopolitan (also: Subakhmimic, Assiutic). In terms of time of attestation and localization, Lycopolitan is comparable to Akhmimic. Lycopolitan and Akhmimic are very similar, and it seems not improbable that the differences between both dialects are only graphical in character.
- Fayyumic (Faiyumic). Texts in this dialect are attested from the 3/4th to the 10th century AD. This dialect is habitually assumed to have been located in the Fayyum, a geographically isolated area to the West of the Nile. Fayyumic is one of the lesser researched Coptic dialects.
- Mesokemic (also: Oxyrhynchite), a dialect first described by Kahle (1954: I, 220-

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[19] The numerous writings of the abbot Shenoute (4th/5th century AD) are the most famous specimens of native Sahidic literature.

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227), is localized in Middle Egypt and shows affinities to Fayyumic. This dialect is attested by a few manuscripts from the 4th and 5th centuries. Since most Mesokemic texts have been found comparatively recently, this dialect has not been adequately included in the available Coptic dictionaries.

The terms "Sahidic" and "Bohairic" are based on the indigenous tradition. They are already found in a Coptic grammar by Athanasius of Qus (11th century AD) as respectively *ṣaʿīdī* and *buḥairī*.[20]

Rodolphe Kasser has developed a system of sigla – consisting of letters sometimes followed by an additional number – for designating numerous different varieties of Coptic. Sahidic is encoded as *S*, Bohairic as *B*, certain subvarieties of Bohairic as *B4*, *B5* etc. In Kasser (1990) he presents a standardized version of these abbreviations. A more concise list of dialect sigla is to be found in Vycichl (1983: xi-xii).

In this book I mark the dialectal provenance of Coptic words by a superscript letter to the left: ^{s} Sahidic, ^{b} Bohairic, ^{a} Akhmimic, ^{l} Lycopolitan, ^{f} Fayyumic, ^{m} Mesokemic.

2.4 Major dictionaries and grammars of Egyptian

The following is a list of some major dictionaries and grammars covering various stages of Egyptian.

2.4.1 Dictionaries

Dictionaries marked by an asterisk (*) provide each entry with selected references to occurrences in the texts. There exists no thesaurus of the Egyptian language to date.

Dictionaries of several stages of Egyptian

- *Erman & Grapow (1926-1963) (commonly abbreviated *Wb*) (Egyptian – German): Although becoming slightly outdated, this is still the most important Egyptian dictionary. Covering hieroglyphic and hieratic texts from all periods (Old Egyptian, Middle Egyptian, Neo-Middle Egyptian, Late Egyptian); detailed lexical entries which pay notice to diachronic differences, seven volumes (the sixth volume being a German-Egyptian index), additional volumes with Belegstellen, ca. 16 000 entries.
- Hannig (1995) (Egyptian – German): A modern dictionary with shorter entries, covering texts written until the New Kingdom (Old Egyptian, Middle Egyptian, Late Egyptian), ca. 16 000 entries, with additional glossaries of divine names as well as place names.

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[20] Kasser (1973: 76f.) cites the relevant passage in the Arabic original as well as in translation.

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Dictionaries of Middle Egyptian

- *Faulkner (1981) (Egyptian – English): A concise dictionary of Middle Egyptian, ca. 5 000 entries.
- *von Deines & Grapow (1959), *von Deines & Westendorf (1961/62) (Egyptian – German): Dictionaries specialized on Middle Egyptian medical texts, altogether ca. 2 500 entries.
- *van der Plas (1996): This is a searchable glossary of the Coffin Texts on the World Wide Web, ca. 6000 entries.

Dictionaries of Late Egyptian

- *Lesko (1982-1990) (Egyptian – English): Dictionary of Late Egyptian in five volumes (the fifth volume being an English – Late Egyptian index), ca. 5 000 entries.

Dictionaries of Neo-Middle Egyptian

- *Wilson (1997) (Egyptian – English): Dictionary covering the Neo-Middle Egyptian inscriptions of the temple of Edfu (237 – 57BC), also containing information about the use of the same words in earlier texts, ca. 4 000 entries.

Dictionaries of Demotic

- Erichsen (1954) (Demotic – German), Demotic dictionary, ca. 4 000 entries. A supplementary volume by Janet H. Johnson *et al.* (Chicago) is in preparation.

Dictionaries of Coptic (the Coptic dictionaries cover all dialects at once)

- *Crum (1939) (Coptic – English): The most detailed Coptic dictionary and the only one to pay any attention to semantic differences among the Coptic dialects, containing an English-Coptic index, ca. 5 000 entries. The numerous Greek borrowings into Coptic are excluded. *Kasser (1964 and 1966) are complementary volumes to Crum and mainly present additional writings and dialectal varieties.
- Westendorf (1965/1977) (Coptic – German): Comprehensive dictionary containing several dialect forms and words that were not treated by Crum yet, but entries are less detailed. Greek borrowings are excluded. Contains a German-Coptic index. Ca. 8 000 entries and a glossary of place names.
- Kasser (1967) (Coptic – French): This is the only Coptic dictionary to include Greek borrowings. However it has never been finished and contains entries for the letter ⲁ and parts of ⲃ only. Ca. 1 300 entries.
- A specialized glossary of the Bohairic dialect is found in Mallon (1956: 150-201) (Coptic – French).

Etymological dictionaries

- Among the Coptic dictionaries, Westendorf (1965/1977) and Kasser (1967) contain etymologies relating the Coptic words to their Egyptian (or other) predecessors. In addition, there are two specialized Coptic etymological dictionaries by Černý (1976) and Vycichl (1983).
- Hoch (1994) is a dictionary of Semitic loan words in Late Egyptian.
- There is no complete etymological dictionary of Egyptian. Schneider (1997) lists Afroasiatic etymologies of 117 Egyptian words according to the most recent state of

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affairs. Vycichl (1983) also proposes numerous Afroasiatic etymologies of Egyptian words which are still present in Coptic.

At present there still exists no dictionary of Old Egyptian, however Allen (1984: 541-601) contains a glossary of Old Egyptian verbs with ca. 700 entries.

Aside from the indices in several of the dictionaries mentioned above, there is no dictionary with Egyptian or Coptic as target languages. A German – Egyptian dictionary by Rainer Hannig is in preparation.

2.4.2 Grammars

Egyptian in general	Schenkel (1990), Loprieno (1995). Both are valuable introductions into the Egyptian language as a whole and are primarily designed for a linguistic audience. These are no grammars in the strict sense.
Old Egyptian	Edel (1955/64). Another Old Egyptian grammar by Frank Kammerzell is in preparation.
Middle Egyptian	Gardiner (1957) is the most detailed grammar of Middle Egyptian. More recent research on Egyptian syntax has brought about alternative views in crucial areas, for these cf. e.g. Junge (1978) and Schenkel (1991) (defending the so-called "standard theory" of Middle Egyptian syntax) and Schenkel (1997a) (abandoning the "standard theory"). There is a specialized grammar of the medical texts by Westendorf (1962).
Neo-Middle Egyptian	Jansen-Winkeln (1996) and der Manuelian (1994) are concerned with the grammar of early Neo-Middle Egyptian. Late Neo-Middle Egyptian, a unique language in which a huge proportion of the known Egyptian texts is written, has been researched little; there is only an outdated grammar by Junker (1906).
Late Egyptian	Černý & Groll (1993) is the most detailed modern grammar of Late Egyptian; for many questions the older grammar by Erman (1933) is still helpful. Winand (1992) is important for the verbal system. Junge (1996) and Neveu (1996) are modern teaching grammars of Late Egyptian.
Demotic	Spiegelberg (1925), Lexa (1949), Simpson (1996).
Coptic in general	Stern (1880) treats Bohairic and Sahidic simultaneously with occasional references to Fayyumic. For many questions, this is still the most detailed Coptic grammar. Till (1961) is a comparative grammar of five Coptic dialects. Steindorff (1951) and Vergote (1973/ 83), while mainly concerned with Sahidic, include numerous remarks on the other Coptic dialects. Atiya (1991) contains many up to date articles on individual Coptic dialects.

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Sahidic Coptic	Till (1955). Another Sahidic grammar by Bentley Layton is in preparation. There is a specialized grammar of the writings of Shenoute by Shisha-Halevy (1986). Lambdin (1982) and Shisha-Halevy (1988) are teaching grammars of Sahidic.
Bohairic Coptic	Mallon (1956).
Akhmimic Coptic	Till (1928).

2.5 The indigenous Egyptian scripts

2.5.1 General observations

The following discussion is not an exhaustive description of the Egyptian writing system, but rather provides a general overview of some of its major peculiarities and theoretical problems.

The problems associated with defining graphemes are essentially the same as the problems encountered in phonology. They affect both the paradigmatical level (i.e. "Should two similar signs be distinguished, or are they the same?") and the syntagmatical level (i.e. "Is a given graphical form to be analysed as a single grapheme, or is it only part of a grapheme, or does it cover two or more graphemes?"). In my opinion, the same problem occurs here as in the domain of phonology, namely that there is not always a definite answer to such questions, but several contradictory analyses may be equally acceptable.

Although there has never been a theoretical discussion on how to define a grapheme in Egyptian, Egyptologists have come to establish sign inventories by which the infinite variety of actual graphic forms is reduced to a set of approximately 1000 hieroglyphs (increasing to about 7000 if the ornate Ptolemaic temple inscriptions are included), a number which is small enough to be learned by the student, to be analyzed by the scholar, or to be reproduced in modern typesetting.

Egyptologists refer to each hieroglyph by a reference code composed of a letter (A to Z as well as Aa) and a following number. Sign lists arranged by these codes can be found in Gardiner (1957: 438-548), Hannig (1995: 1025-1182), and Schenkel (1983a: 45-83).

2.5.2 Writing styles

Two writing styles were used in ancient Egypt, both of which are attested side by side from the earliest periods on. One of them is the hieroglyphic style which is used especially for inscriptions in stone. This type is characterized by detailed sign forms, frequently representing objects of the natural world. Modern typesetting such as found in this book employs hieroglyphs as the means of rendering Egyptian writing. The second form of writing is a handwritten style known as hieratic which is characterized by cursive sign forms and by the use of numerous ligatures. Many subvarieties and interme-

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diate forms of both styles exist. In the Late Period (from the mid of the 1st millennium BC on), a late variety of hieratic called Demotic is clearly distinct from a more conservative form of hieratic which by then has become restricted to use in texts of religious content (hence the Greek term ἱερατική *hieratic*, "holy [script]").

In Ancient Egyptian daily life, the handwritten style played a much greater role than the hieroglyphic style. It is generally assumed that the scribes were taught the handwritten style first, and for many of them this remained the only way of writing. The education of modern Egyptologists goes the opposite way. Our academic education begins with hieroglyphs, only afterwards the hieratic and Demotic scripts may be acquired. The conditions for preservation were generally better for hieroglyphic inscriptions than for hieratic texts, which were mostly written with ink on papyrus, stone and potsherds, so the known hieroglyphic texts are somewhat in the majority nowadays.

The hieroglyphic and the hieratic styles are not merely calligraphical variants of one another; rather, they show pronounced differences on a structural level. For a brief overview of structural differences between both Egyptian writing styles see GARDINER (1929); a detailed analysis does not yet exist. Two hieroglyphic signs may be indistinguishable in hieratic (e.g. 𓆵 M 6 and 𓐠 Aa 18); on the other hand, there may be two distinct hieratic correlates to one hieroglyphic sign (e.g. to 𓅓 G 17). Moreover, the general writing conventions are not the same for both styles; for example, the use of "phonetic complements" (redundant phonograms) is more frequent in hieratic than in hieroglyphic. To take just one example, the masc. sing. definite article ‹pꜣ› is usually written 𓅮 (phonogram ‹pꜣ›) in hieroglyphic texts, but in hieratic it is written with what would be transliterated as 𓄿𓅮 in hieroglyphs (phonogram ‹pꜣ› + phonogram ‹ꜣ›), where furthermore the hieratic equivalent of 𓅮 cannot be distinguished from the hieratic sign for 𓅯 (phonogram ‹ẖn›). In modern text publications, hieratic texts are frequently "transliterated" into hieroglyphs although the resulting hieroglyphic text is artificial in nature and would never have been written as such by the ancients (for example, the hieratic masc. sg. definite article is frequently reproduced as 𓄿𓅯). The late Demotic script has become so much removed from the hieroglyphic system that a transcription of this kind faces serious difficulties.

Since the choice of a specific writing style is motivated by similar factors as is the choice of a specific diastratic variety of Egyptian, the writing modes are more or less associated with separate linguistic systems. In the Late Period, for example, the Demotic script is primarily used for recording the popular language (which we likewise call "Demotic"), whereas hieroglyphs are normally used for writing Neo-Middle-Egyptian. However, this is only a general rule to which there are exceptions.

2.5.3 Writing direction

In writing and reading the Latin script, individual signs proceed sequentially from left to right (the lines from top to bottom). In Egyptian, signs are also read in a sequence,

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however their graphical arrangement is somewhat more complex and varies according to four binary parameters. Before attempting to read, it is necessary to find out how the parameters are set.

1) One parameter determines the sequence of two signs which are arranged vertically. In Egyptian, the almost invariable rule is that writing and reading proceeds from top to bottom; exceptions are rare (see Fischer 1977b: 1193).

2) Another parameter determines the sequence of two signs which are arranged horizontally. In the handwritten style signs are always written from right to left, however this parameter is variable in the hieroglyphic style where signs can also be written from left to right, but they are then mirrored accordingly (hieroglyphs representing human beings or animals usually look towards the beginning of the line).

Under certain conditions a section of text or even a single sign may be turned against the general orientation of the text: these signs are "reversed".[21] Occasionally signs may look towards the end of the line, i.e. their relative horizontal sequence is not as expected from their orientation: this is "retrograde" writing. It occurs in certain religious contexts (and, by the way, generally in Meroïtic hieroglyphs).

3) A third parameter determines whether a text is written in lines or in columns. This parameter is independent from the others since small signs may in any case be arranged contrary to the general writing orientation to avoid blank space (if a text is written in lines, certain signs will nevertheless be arranged above another, and vice versa)[22]. In the Old Kingdom columns were preferred, but afterwards writing in lines becomes more and more common and in fact obligatory in the handwritten style from the New Kingdom on.

4) The direction in which two lines or columns are arranged typically corresponds to the sequence in which two individual signs would be read (parameters 1 and 2). Only certain religious texts (especially the manuscripts of the Book of the Dead) are written in columns arranged contrary to the horizontal sequence of individual signs. This is also traditionally called "retrograde" writing.

In this book, hieroglyphs are generally printed in lines from right to left.

2.5.4 Distinctive features

The following remarks will mainly be restricted to the hieroglyphic style. Hieroglyphs can be incised in a very detailed and complex manner, but in most signs the outline alone seems to be of linguistic relevance. For example, in a sign like (G17), which as printed here seems rather complex and can be much more complex in elaborate

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[21] On reversed writing see Fischer (1977a). On the terminology "reversed" and "retrograde" see Schenkel (1983b: 179) and Fischer (1977b: 1192f.).

[22] It has frequently be said that hieroglyphic texts are arranged into "squares" but this is incorrect, see Schenkel (1997a: 50f.).

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inscriptions, all interior details can be neglected (and, in fact, they are in many texts) since no other sign exists from which it is distinguished by mere internal details. Round signs such as 𓇳 (N5), 𓊖 (O49), 𓊗 (O50), 𓐍 (Aa1) seem to constitute the major exception to this rule, however these signs are not always clearly distinguished in hieroglyphic inscriptions. Likewise the relative size of signs usually seems to be irrelevant; it may vary within certain limits according to the nature of the accompanying signs in order to minimize the space left in between. For example, 𓀀 is larger than 𓃀 in 𓀀𓈖𓃀𓋴 *snb-i* "may I become healthy", but 𓃀 is larger than 𓀀 in 𓎟𓏪𓀀𓁐𓅱𓃀 *bw-nb* "everyone". Moreover, a few signs may be rotated for calligraphical reasons without change of function, such as 𓊽 ~ 𓊾 (O29) and 𓏛 ~ 𓏜 (Y1).

Which details of hieroglyphs are graphemically significant and which are not cannot, of course, simply be estimated from their graphical appearance but is rather a matter of convention. For example, the number of indents in the sign 𓈖 (N35) seems to have no linguistic function and may at best indicate the meticulousness with which the text was written. The variation ranges from a simple straight line (regularly so in hieratic, also in simple hieroglyphic inscriptions) up to a colored work of art with much more than twenty indents (e.g. in the texts of Sethos' I royal tomb in the Valley of the Kings). The shapes 𓎼 (W17) and 𓎽 (W18) are traditionally recorded as distinct signs, but there is as little functional difference between both variants as in the sign just discussed. By contrast, the difference between 𓇑 (M22) and 𓇓 (M23) which optically is as slight as those mentioned before indicates a clear functional distinction.

As is typical for scripts which are not printed by a fixed set of characters but written manually, many differences which in principle are functionally relevant may be blurred (neutralized). Depending on the ambiguity of the context and probably other factors, a distinction can be pronounced, weak or invisible. This is especially true for the hieratic handwriting, in which the correlates of hieroglyphic signs such as 𓂋 (D21), 𓂧 (D46) and 𓏏 (X1) may be kept distinct, but frequently they are not. Rules for the neutralization of graphical contrasts in the Egyptian scripts have not yet been investigated.

2.5.5 Sign color

Hieroglyphs were frequently painted in color. Although in most cases the pigments have been lost by the present day, there do remain numerous beautifully preserved inscriptions with full colors. Sign color is rarely indicated in Egyptological text publications even where still recognizable. Little research has been conducted by now regarding the question of hieroglyph color (but see Staehelin 1974 and 1990; Smith 1949: 366-382; Kahl 1997).

The color of a hieroglyph is determined only loosely by the natural color of the object which the hieroglyph depicts. That is to say, it is conventionalized to a high degree. To take an example, the human eye is usually painted with dark rims, a white eyeball, and a dark iris in Egyptian art, thus conforming to the natural circumstances. However the sign

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𓁹, which is a picture of a human eye and is also employed in writing the Egyptian word *ỉr.t* "eye", is usually painted with dark rims, a white eyeball, and a red iris (cf. Staehelin 1990: 111). A single sign can be painted polychromatically. For example, the sign 𓏌 (W24) is painted red in the bottom half and blue in the top half. Especially in careful inscriptions, a sign may have numerous details in diverse colors which are superimposed on its basic color. Ultimately, the background color can also influence the color of the hieroglyphs. For instance, signs which should be yellow may be painted green if there is a yellow background.

It is not yet known to what degree colors are distinctive and how many distinctive colors there are (cf. Staehelin 1990: 107). It appears that a formal distinction of hieroglyphs can be emphasized or even replaced by the use of different colors. For example, the signs 𓇳 (N5) and 𓐍 (Aa1), which are frequently written without interior details and share the same form then, are painted in red and green respectively (Staehelin 1974: 52) which produces a clear distinction (if color is used at all). Similarly, 𓄿 (G1) and 𓅂 (G4), which are indistinguishable by form in many inscriptions, may be differentiated by their colors (Davies 1958: 27, cf. Staehelin 1990: 113). There is the possibility that color serves to express graphemic differences which have yet to be revealed. This might be true of a sign such as 𓄡 (F32), phonogramm ‹ẖ›, which shows a great variety in coloring (cf. Staehelin 1990: 113).

I have indicated the colors of the monoconsonantal signs in § 2.6.2.

2.5.6 Segmentation

On the syntagmatic level, in the hieroglyphic style at least, a certain segmentation is suggested by the spaces which regularly separate the elements of the hieroglyphic script. But this preliminary segmentation needs some further qualification. For instance, the function of the group 𓈗 bears no obvious relationship to the function of a single 𓈖 and should be considered a grapheme in its own right. Accordingly, both are assigned different numbers in the sign lists (N 35 and N 36, respectively).

Differences on the diachronic level are frequent. To take just one example, the hieroglyph 𓄑 (F 18) has several functions, one of them being to serve as a complex phonogram ‹ḥw›. Later, the custom develops to add the sign 𓏛 (Y 1) below 𓄑 wherever the reading ‹ḥw› is intended. There is no easy way to tell from which time on 𓄑𓏛 should be considered a single grapheme. Furthermore, due to phonological change the sound value of the phonogram gradually changes from ‹ḥw› to ‹ḥ›. In Demotic, from 𓄑𓏛 a ligature develops which can no longer be analysed into its former components. This is a popular phonogram for the consonant ‹ḥ› and is the ultimate source of the letter ϩ /h/ of the Coptic alphabet.

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2.5.7 Functional classes within the hieroglyphic script

I assume that in general two basic functions should be distinguished within graphemic systems. A sign can have a phonetic / phonological reference (we may call it phonogram), or a semantic reference (we may call it semogram). If a grapheme is found in contexts which share a common phonetic trait, it can be considered to encode some phonetic information. If a grapheme is found in contexts which share a common semantic trait, it can be considered to encode semantic information. Of course, a single grapheme may fulfill more than one function and be polyfunctional (ambivalent).

Many Egyptian graphemes are used only or primarily for writing a single lexeme or a group of words which are etymologically connected. In this case, the contexts in which the grapheme is found share phonetic as well semantic properties, so my definition would allow for a classification both as a phonogram and as a semogram. I suggest to use the term logogram in this case.[23]

The current scripts of modern Europe are primarily of phonographic nature. However, there are a few semographic signs even in English. Examples are ™ (indicating that the preceding name is a registered trade mark) or † (indicating that the person mentioned has deceased). The opposition between capital and small letters is used to express functions which may also be considered semographic in a wider sense (capital letters characterize proper names, honorific terms such as "God" or "Lord", or the beginning of a sentence). Our number signs (1, 2, 3) should be classified as logograms in the sense outlined above.

Although the notions of phonogram and semogram may permit an initial classification, it becomes apparent that more classes than these should be distinguished in complex writing systems such as those of Egyptian. Script-internal criteria such as mutual compatibility, distributional properties, relative position in a word, etc., should also play a role. I will not delve further into these problems here. There is a traditional Egyptological way of classifying signs which, however, is quite variable and not always applied with consistency. For a modern overview of the Egyptian scripts including proposals about the classification of Egyptian graphemes see Schenkel (1994c).

2.5.8 Subtypes of phonograms in Egyptian

The Egyptian script has a set of elementary phonograms for denoting single consonants (monoconsonantal or alphabetic signs). Moreover, numerous combinations of two consonants may be written with specific phonograms (biconsonantal signs) that denote a sequence of two consonants – without regard as to whether or not

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[23] My terminology differs from the Egyptological tradition. What I call semogram is frequently called determinative, what I call logogram is classified as phonogram or as ideogram by Egyptologists.

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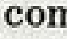
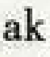
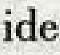
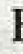
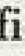
there is an intermediate vowel, and if so which one.[24] It is generally assumed that any biconsonantal sign is equivalent to a sequence of two monoconsonantal signs without change in phonological information, i.e. the number of consonantal distinctions is the same regardless of which phonographic writing method is chosen. The values of most biconsonantal signs are well known because alphabetic signs are frequently written instead of biconsonantal signs or in addition to them (as so-called "phonetic complements"). However, in some cases the evidence is more or less uncertain since monoconsonantal writings are rare, contradictory, or date to periods when certain sound mergers had already taken place. For example, the assumed sound values *wp* of  (F13), *tp* of  (T8), *ẖr* of  (T28), *ꜣb* of  (U23)[25], and *ḥm* of  (U36) are based on comparatively weak evidence. Furthermore it is sometimes difficult to estimate how sound changes affected the value of complex phonograms.

2.5.9 The interaction of phonograms and semograms

Egyptian words can be written with phonograms, semograms, or a combination of both. There are no clear-cut rules for deciding which writing to use, and most words are attested in numerous different graphical variants. Nevertheless, the rule seems to be observed quite strictly that Egyptian complex phonograms are not used across a morpheme boundary (rule by KAMMERZELL 1995: XXXIII and 1998a: 22; there are a few exceptions to this, cf. e.g. FAULKNER 1978).

Fortunately, almost all words are attested in phonographic writing at least occasionally, so there remain few words for which the sound structure is completely unknown.

2.5.10 Different graphemic subsets applied by etymological criteria

It is a familiar phenomenon in writing systems that etymologically different strata within the lexicon are distinguished by the use of different graphemic subsets which are phonetically equivalent. In Japanese, for example, signs of the *Kanji* type can be used for both native words and loans from Chinese, the *Hiragana* type is used preferably in native words, and the *Katakana* type is used mainly for writing words of European origin. In older German texts, native words used to be printed in Gothic types but foreign words in Latin types within the same text. In Persian and Urdu, there are signs which only appear in loan words from Arabic, although they no longer reflect specifically Arabic sounds. This phenomenon even occurs in English, although in a somewhat peripheral manner, where the letter *c* (leaving aside the combination *ch*) is used primarily in words of Romance origin and represents sounds which are written *k* or *s* in words of Germanic origin.

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[24] The existence of several triconsonantal signs is usually assumed as well, but most of these signs can better be classified as logograms.

[25] Cf. EDEL (1955/64: I, § 133).

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The same phenomenon can be observed in Egyptian during two different periods of its history. In the New Kingdom, when numerous words were borrowed from Semitic languages, there existed a specific set of monoconsonantal signs for writing them ("group writing", for details ☞ § 5.4.2). By the time of Demotic, this graphical distinction was abandoned after the Semitic words had been fully integrated into the language.

Again in Coptic, a huge number of loans from Greek were adopted. Here again, it can be observed that many Coptic scribes perceived the native vocabulary and Greek borrowings as two distinct subsets of their language and tried to distinguish them on the graphical level. The letters Ⲅ /g/, Ⲇ /d/, and Ⲍ /z/ were not normally used in native words because Classical Coptic did not have voiced obstruents. However, these letters are frequently employed in Greek words, in many texts even where the Greek etymon had a voiceless obstruent κ /k/, τ /t/, or σ /s/ respectively (for details ☞ § 3.3.5). My interpretation is that most Copts probably did not make a difference in pronunciation between Ⲅ, Ⲇ, and Ⲍ on the one hand and Ⲕ, Ⲧ, and Ⲥ on the other. They merely used the former letters to indicate that the word in question was of Greek origin.

2.6 Transcribing Pre-Coptic Egyptian

2.6.1 On the nature of the conventional transcription

2.6.1.1 General definition

There is a – not fully standardized – convention of transcribing Egyptian. This transcription is widely used in Egyptology and either accompanies citations in the Egyptian script or replaces them altogether. Also in this book, the Egyptological transcription is used rather than the original script (except for Coptic). For variation in the transcription symbols among different scholars ☞ § 2.6.2.

Kammerzell (1995: xxxix) describes the conventional Egyptological transcription as "die konventionalisierte Repräsentation der konsonantischen Bestandteile derjenigen Morpheme der ägyptischen Phonemsprache, die Korrelate in der hieroglyphischen Graphemsprache besitzen". The transcription thus neglects all semographic information conveyed by the Egyptian script. Furthermore, it attempts to achieve consistency in transcribing a given word form. The transcription of a specific word does not indicate whether it is written phonographically, semographically, or by a combination of both methods. Neither does it usually show whether all consonants are explicitly written in the actual case or whether some of them are merely supplied by presumably more "complete" phonographical renderings of the same word form in other texts. The huge graphical variability of Egyptian is therefore concealed as soon as words are put into transcription.

In most scholars' transcriptions, certain morphemes are separated from the lexical stem by varying kinds of punctuation marks ("Strukturzeichen"). In this book, most suffixes are separated from the stem by a dot (.), including the nominal feminine ending *.t*, the

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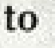
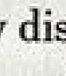
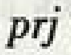
nominal plural ending *.w*, the adjectival ending *.ï*, the verbal past tense ending *.n*, and the personal endings of the stative conjugation. Suffix pronouns are separated from the stem by a hyphen (-).

Transliterating the Egyptian script, i.e. producing an unequivocal representation, is uncommon. The only system of transliteration that has ever been proposed is by Schenkel (1983a; additions and modifications in Schenkel 1984a, 1984b, 1984c, and 1985), but it has not (yet) come into use among Egyptologists. The conversion of hieratic into hieroglyphs in modern text editions is conventionally called "transliteration" by Egyptologists[26] although this process is not entirely unambiguous.

2.6.1.2 *Problems connected with the transcription of certain words*

Consonants can be left unwritten in specific instances of a word although they are supposed to have been pronounced ("defective writing", for details ☞ § 2.6.4). Thus, doubt may arise about the exact nature and number of consonants to be assumed for a word, and scholars frequently disagree in this respect. For example, the word  "town" is transcribed variously as *niw.t* (Gardiner 1957: 498), *nw.t* (Osing 1976a: 378), or *n'.t* (Edel 1980: 16-19); the word  "house" as *pr* (Gardiner 1957: 492), *prj* (Fecht 1960: § 150), and *prw* (Osing 1976a: note 1122 on p. 836f.); or the word  "king" as *swtnj* (Sethe 1907: 25; this reading is outdated nowadays), *nj-sw.t* (Gardiner 1957: 482), *jnj-sw.t* (Fecht 1960: §§ 30-33), *nzw* (Schenkel 1986, Schneider 1993), and several others. Cf. also the unconventional readings which Hodge (1991a) adopts for some words. In this book, I have tried to indicate uncertainties about the transcription whenever this is vital for my argumentation.

2.6.1.3 *Interpreting transcription symbols*

The fact cannot be stressed enough that the transcription is purely conventional. The Egyptological transcription must not be interpreted as a phonological and even less as a phonetic representation. During the period of hieroglyphic use covering more than 3000 years, the phonetic appearance of Egyptian changed drastically; however the writing of many words changed little, and so does the transcription.

Let us discuss just one example. In the word ‹rʿ› "sun" the symbol ‹r› denotes a liquid whose exact original pronunciation is disputed. ‹ʿ› is a symbol for an original dental stop /d/. The pronunciation during the Middle Kingdom may have been something like /ˈriddV/ or /ˈliddV/ (V = unknown vowel). By the New Kingdom, several phonetic developments including the shift /d/ > /ʕ/ (☞ § 3.6.2) had taken place. The word was now pronounced as /ˈreʕə/ or similarly although its writing did not change. By the Roman period, the word had been contracted to /ˈre/ in pronunciation, but the word was still written ‹rʿ› as already in the beginning of Egyptian history.

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[26] Cf. Fischer-Elfert (1997: note 9 on p. VIII) and Kammerzell (1995: XXXVIII).

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2.6.2 The monoconsonantal signs and their transcription

There is no full agreement about the transcription of the monoconsonantal phonograms of Pre-Coptic Egyptian. The following chart shows the transcription symbols used by some important scholars. In this book, I adopt the system by Loprieno (1995) (for the *j*-signs ☞ § 2.6.3). On the alphabetic arrangement ☞ § 2.8.1.

hieroglyph	sign color[27]	Budge (1920)[28]	Wb.	Gardiner (1957)	Edel (1955/64)	Callender (1975)	Faulkner (1981)	Vernus (1988)	Hodge (1990)	Schenkel (1990)	Loprieno (1995)
𓄿	–	*a*	*ꜣ*	*ꜣ*	*ꜣ*	*ꜣ*	*ꜣ*	*ꜣ*	*ꜣ*	*ꜣ*	*ꜣ*
𓇋	green	*ȧ*	*i, j*	*i*	*j*	*i*	*i*	*j*	*ʔ*	*i*	*j*
𓇌	green	*i*	*j*	*y*	*j, jj*	*y*	*y*	*y*	*y*	*y*	[29]
𓏭	black	*i*	*j*	*y*	*j*[30]	*y*	*y*	*j*	[31]	*ỉ*	
𓂝	red	*ā*	*ꜥ*	*ꜥ*	*ꜥ*	*ꜥ*	*ꜥ*	*ɛ*	*ꜥ*	*ꜥ*	*ꜥ*
𓅱	yellow	*u*	*w*	*w*	*w*	*w*	*w*	*w*	*w*	*w*	*w*
𓃀	red	*b*	*b*	*b*	*b*	*b*	*b*	*b*	*b*	*b*	*b*
𓊪	green	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*
𓆑	yellow	*f*	*f*	*f*	*f*	*f*	*f*	*f*	*f*	*f*	*f*
𓅓	yellow	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*
𓈖	black	*n*	*n*	*n*	*n*	*n*	*n*	*n*	*n*	*n*	*n*
𓂋	red	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*
𓉔	black	*h*	*h*	*h*	*h*	*h*	*h*	*h*	*h*	*h*	*h*
𓎛	green	*ḥ*	*ḥ*	*ḥ*	*ḥ*	*ḥ*	*ḥ*	*ḥ*	*ḥ*	*ḥ*	*ḥ*
𓐍	green	*kh*	*ḫ*	*ḫ*	*ḫ*	*ḫ*	*ḫ*	*ḫ*	*x*	*ḫ*	*ḫ*
𓄡	–	*kha*	*ẖ*	*ẖ*	*ẖ*	*ẖ*	*ẖ*	*ç*	*x̬*	*ẖ*	*ẖ*
𓊃	red	*s*	*s*	*s*	*z*	*s, z*	*s, z*	*z*	*z*	*s*	*z*
𓋴	red	*s*	*ś*	*s*	*s*	*s*	*s*	*s*	*s*	*ś*	*s*
𓈙	black	*sh*	*š*	*š*	*š*	*š*	*š*	*š*	*š*	*š*	*š*
𓈎	black	*q*	*ḳ*	*ḳ*	*q*	*ḳ*	*ḳ*	*q*	*q*	*ḳ*	*q*
𓎡	green	*k*	*k*	*k*	*k*	*k*	*k*	*k*	*k*	*k*	*k*
𓎼	red	*g*	*g*	*g*	*g*	*g*	*g*	*g*	*g*	*g*	*g*
𓏏	black	*t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*
𓍿	green	*th*	*ṯ*	*ṯ*	*ṯ*	*ṯ*	*ṯ*	*č*	*č*	*č*	*ṯ*
𓂧	red	*ṭ*	*d*	*d*	*d*	*d*	*d*	*d*	*d*	*ṭ*	*d*
𓆓	yellow	*tch*	*ḏ*	*ḏ*	*ḏ*	*ḏ*	*ḏ*	*ǧ*	*ǧ*	*č̣*	*ḏ*

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[27] As described in § 2.5.5, hieroglyphs are colored in many inscriptions. The chart indicates the predominant sign color I found to occur most frequently. In careful inscriptions signs may have additional details inserted in other colors. 𓄿 is polychrome, the color of 𓄡 is variable. I have not distinguished between black and blue.

[28] This is an example of the older transcription practice comprising vowels for which Budge is one of the last influential proponents. Although this kind of transliteration is now completely outdated, I cite it here because some works of Budge are still in use among a broader public.

[29] Although Loprieno indicates "*jj* or *y*" as the transcription in the chart on p. 15, he uses *j* in the overwhelming majority of cases in his book. The same for 𓏭.

[30] See Edel (1955/62: I, § 293).

[31] No example found in Hodge's data.

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2.6.3 The *j*-signs

Three signs pose special problems to the transcription, namely 𓇋 ‹i›, 𓇌 ‹y›, and 𓏭 ‹ï› (on ‹i̯› ☞ § 2.6.4).

2.6.3.1 Distribution

In Old Egyptian 𓏭 is not yet in use. 𓇌 looks like a mere sequence of two single 𓇋's. It is, however, frequently found as an alternative writing of 𓇋 under conditions which are not yet clear.

In Middle Egyptian all three signs indicated are in current use and variation among them becomes rare. It can be roughly stated that at this time 𓇋 is not restricted in distribution, whereas 𓇌 can appear at a morpheme boundary only, and 𓏭 is even more restricted in that it is used only morpheme-finally.

In Late Egyptian, all three signs fall into a group of graphemes which are employed in a very inconsistent manner (besides 𓇋, 𓇌, and 𓏭, this also affects especially ‹ꜣ›, ‹w›, and ‹t›). It seems that the corresponding sounds had been lost in the spoken language in many positions, so these former phonograms were no longer correlated to a feature in the contemporary pronunciation (☞ § 3.14.2).

2.6.3.2 Function

The sign 𓇋 can be represented in Coptic as (ⲉ)ⲓ /j/, or dropped altogether. Three assumptions about its sound value have been advanced:

1) 𓇋 was originally /j/ but it was lost by the time of Coptic in many enviroments. This is the view e.g. of Dyroff (1910), Vycichl (1940: 84-88), Kammerzell (1992: note 39 on p. 168f. and 1995: XLIV and XLVI), and Loprieno (1995: 33).

2) 𓇋 originally had two sound values, namely /j/ and /ʔ/. This ambiguity was by and large preserved until the Coptic period, where /ʔ/ is not expressed in writing at all. This view is favored by Sethe (1899-1902: I, §§ 88, 100-102, 109f.). Sethe assumes that while 𓇋 is a phonogram of ambiguous value, its graphical alternants 𓇌 and 𓏭 are clear indicators of /j/ as opposed to /ʔ/. Sethe's view is adopted e.g. by Edel (1955/64: I, § 137) and Gardiner (1957: § 20).

   Sethe made this proposal because exact conditions for the preservation and the loss of ‹j› cannot always be specified. On this problem ☞ § 3.14.2.2.

3) Albright (1946b: 319) and Hodge (1991b: 383) express the view that the original sound value of 𓇋 is /ʔ/, which implies that Coptic /j/ is a later development.

In my opinion assumption 1) is the most plausible. As shown in § 3.14.2, 𓇋 fails to leave traces in Coptic primarily in the same environments in which ‹w› is also lost in Coptic. The most plausible conclusion is that both 𓇋 and ‹w› originally represented glides which were subsequently lost in largely parallel developments. I also argue in § 3.4 that we have no indications that glottal stops were spoken in Coptic nor in Egyptian.

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At least as can be judged from Coptic, there seems to have been no phonetic difference between 𓇋, 𓇌, and 𓏭. The sounds rendered by all three signs are equally preserved as /j/ or lost by the same conditions in Coptic. It is possible that these signs never expressed a phonetic distinction but instead their functional difference basically was to indicate morphological boundaries or other features. It is also possible that they did originally express a phonetic distinction which was lost later.

Schenkel (1994b: 13 and 1997a: 30) suggests that, unlike 𓇋 and 𓇌 which are always consonants, 𓏭 represents a morpheme- or wordfinal posttonic vowel /i/ at least in many cases. Note, however, that some words which are quite regularly written with 𓏭 *ï* still have consonantal /j/ in Coptic (e.g. Late Egyptian *dï* "here" > ⲧⲁⲓ /'taj/, *r-ḥrï* "up" > ⲉϩⲣⲁⲓ /əh'raj/).

2.6.3.3 *Transcription*

In the 19th century, scholars distinguished all three signs in transcription (e.g. Brugsch & Erman 1889: 𓇋 = *ỉ*, 𓇌 = *y*, 𓏭 = *ï*). (The symbol *ỉ* is a compromise between *i* and *ʾ* both of which were considered possible sound values at that time.) When examining Old Egyptian texts, Steindorff (1892: 713-716) came to the conclusion that 𓇌 and 𓏭 were not originally used but secondary developments of the Egyptian script. Since Egyptological transcription has always attempted to render the most ancient shape of words rather than their synchronic reality, this insight led scholars to give up a consistent differentiation of these signs (for details ☞ 2.6.2), even though Steindorff himself proposed to keep the symbols *y* and *ï* for transcribing later stages of Egyptian (Steindorff 1892: 729). A modern exception is Schenkel who in a recent paper (Schenkel 1994b) reintroduces the symbol *ï* for 𓏭 as opposed to *y* for 𓇌.

I have attempted to distinguish between *ỉ*, *y*, and *ï* in the transcription within this study. If this distinction is not possible for various reasons (e.g. for some polyconsonantal signs it is unclear which specific *j*-variety is to be read), I use *j* as an unspecified symbol.

2.6.4 Defective writing

Even when a word is rendered primarily by phonograms, consonants which we assume to have been spoken in this word at the given time may fail to be written. This phenomenon is known as "defective writing" and was first described by Erman (1891). Modern Egyptology assumes defective writings very frequently.

There are basically three reasons to assume defective writing:

1) A word or morpheme appears in varying writing forms both with and without a certain consonant, frequently even within a single text. For example, the pronominal suffix 1st pers. sg. masc. can be a) written logographically, b) written phonetically as *ỉ*, or c) left completely unwritten in Egyptian. It is generally assumed that it was pronounced as *ỉ* in all cases. This seems to be confirmed by Coptic where this suffix

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is always preserved as /j/ in phonetic environments which regularly preserve /j/ at all. Option c) (defective writing) is very common for this morpheme throughout all periods of Pre-Coptic Egyptian. The same phenomenon occurs in many other Egyptian morphemes and words.

Although some of these defective writings may be explainable by morphological or phonetic rules which have still to be discovered,[32] the assumption can probably not be avoided that suppression of spoken consonants in writing actually existed.

2) A consonant is not (or rarely) written in Egyptian but appears in Coptic. For example, the noun *ḥnq.t* "beer" is usually written *ḥq.t*, whereas *-n-* appears only in late texts and in Coptic (^{S}ϨⲚⲔⲈ). Since we do not know a linguistic change which could have led to the development of *-n-* in Egyptian, it is generally assumed that *-n-* had always been present in this word but was hidden by defective writing (cf. Edel 1955/64: § 34). Defective writings of this type are less frequent than those of type 1).
3) A consonant is never written in Egyptian nor is it directly visible in Coptic. However scholars assume it was there because according to the syllable structure rules (☞ § 4.2) the word must have had one more consonant than is written to be identifiable with the presumed Coptic successor. This type of defective writing is assumed frequently, however these are the most dubious cases of defective writing. For discussion ☞ § 4.8.6.

Defective writing does not apply at random but affects different consonants to a different degree. By far the most affected are ‹j› and ‹w›, to a lesser degree ‹n›, ‹m›, ‹r› and ‹ꜣ›. Other consonants are hardly ever written defectively. It has not been possible, however, to find exact conditions for defective writing.[33]

An explanation of defective writing may be the high degree of sonority of the consonants being affected. Bearing in mind the general principle of Egyptian orthography not to write vowels, which rank at the top of sonority hierarchy, it might be plausible that consonants of high sonority can also be unwritten.

From the New Kingdom on, it becomes very common for the monosyllabic prepositions ‹m›, ‹n› and ‹r› to be omitted in writing.[34] This might point to a syllabic, i.e. vocalic, realization of these consonants.

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[32] Certain graphical variations that were formerly interpreted as defective writings have recently been reinterpreted as morphologically or phonetically conditioned variations (Kammerzell 1990 and 1991a, Schenkel 1994a). It is possible that more writing variations will be linked with functional differences in the future.

[33] Kahl (1992: 104) gives as a restriction, valid for the Pyramid Texts only, that defective writing does not affect a consonant which forms the onset of a closed syllable, with the exception of syllables containing a morpheme boundary. Note that this rule is formulated within the framework of the traditional syllable structure rules.

[34] Cf. Kroeber (1970: 45-50) and Winand (1992: 413-423, 504-510). The preposition ‹ḥr› can be omitted likewise from Dynasty 18 on. Here another explanation must probably be found.

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Since especially ‹j› and ‹w› are often written defectively, it is easy to postulate their existence in a word in which they are rarely or never written. Scholars frequently disagree in where to assume unwritten *j*'s and *w*'s (☞ § 2.6.1.2). The hypothetical character of such consonants is not usually indicated in the transcription. Only a few scholars attempt do differentiate reconstructed ‹j›/‹w› from actually attested ‹j›/‹w›. Callender (1975: 5) introduces the symbols ‹j›[35] and ‹ẉ›, Schenkel (1987: 30, 150) ‹i̯› and ‹u̯› respectively for this purpose. Both scholars, however, differ widely from each other in their use of these signs.

In this book, I frequently use the symbol ‹i̯› in verbs of the so-called *tertiæ infirmæ*-class in which a consonant such as /j/ is hardly ever written but is sometimes present in Coptic and is also demanded by the syllable structure rules.

2.6.5 The Egyptological scholarly pronunciation

2.6.5.1 Introduction

It is true that the vocalization of many Egyptian words can be reconstructed to a certain extent – such vocalized forms are frequently cited in parentheses throughout this book. However the fact that vowels are not indicated in Egyptian writing nor in the conventional transcription poses a problem to the everyday practice of Egyptologists. In scholarly communication and language teaching they need a means of reading Egyptian texts or transcriptions aloud without first having to delve into the complexities of vocalic reconstructions. For this purpose, Egyptology has developed a set of rules by which the transcriptional consonant clusters are transformed into sequences which can be pronounced easily. These rules have developed more or less unconsciously and are not the result of deliberate planning. The basic principles can be summarized as follows:

- Each consonant symbol is assigned a conventional pronunciation which is easy to produce for speakers of European languages.
- Certain consonant symbols may be assigned a vocalic realization.
- Additionally, *e*-vowels are added which have no equivalent in the Egyptian text nor in the transcription.
- Suprasegmental features are added in pronunciation.
- The morphological structure of the Egyptian utterance can have implications on the pronunciation.

The pronunciation rules are historically derived from early conceptions about the Egyptian sound system such as exemplified by Budge's (1920) transcription symbols listed in § 2.6.2. The rules are no longer being changed according to our progressing knowledge of Ancient Egyptian phonology; instead all Egyptologists know that their scholarly pronunciation is entirely conventionalized and is hardly related to the historical pronunciation

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[35] He uses the symbols ‹i› and ‹y› for the written glides.

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of Egyptian. Egyptological scholarly pronunciation, although being a remarkable linguistic phenomenon, has rarely been a subject of scholarly investigation (but see Peust 1996). The following is a short account of the pronunciation currently in use at universities in German speaking countries; the habits may be different in other countries. But even in the German speaking area, the pronunciation is subject to huge diatopic, diachronic and idiolectal variation. An Egyptologist who visits another university will certainly encounter pronunciation habits different from what he or she has been accustomed to speak.

2.6.5.2 *Pronunciation of consonants*

The conventional pronunciation of most consonants is equivalent to the transcription symbols listed above. Common phonetic habits of German such as the devoicing of obstruents or the vocalization of /r/ at the end of a syllable are transferred to the Egyptological pronunciation. Some remarks on single consonants follow:

- Teaching books usually recommend a distinction of ‹ḫ› and ‹ẖ› as [x] and [ç] respectively. Since [x] and [ç] are allophones of a single phoneme in German, many German Egyptologists confuse this distinction.
- ‹h› and ‹ḥ› are usually pronounced identically as [h]. Since in German *h* is only spoken morpheme-initially, many Egyptologists substitute ‹h›/‹ḥ› by [x] or [ç] in non-initial position, whereas others try to keep [h] here.
- Teaching books recommend distinguishing 𓊃 and 𓋴 as [z] and [s] respectively, but this distinction is rarely maintained by German-speaking Egyptologists. Similarly, ‹q› and ‹k› are always pronounced identically as [k].
- 𓂧 is pronounced [d]. This is true even at the university of Tübingen where a different transcription symbol (‹ṭ›) is used for transcribing this letter.
- The most common pronunciation of 𓍿 is [tʃ]. However at certain universities (e.g. Vienna) [ts] is spoken instead. 𓆓 is pronounced [dʒ]; it seems, though, that many Egyptologists tend to confuse it with [tʃ], which is an effect of (dialectal?) German phonology. However where 𓍿 is spoken [ts] the distinction between 𓍿 and 𓆓 remains clear. The pronunciation [tʃ] for 𓍿 comes close to what is nowadays considered its correct historical pronunciation. The variety [ts] seems to be an archaism[36] and might derive from a time when 𓍿 was still supposed to represent an interdental /θ/ (cf. Steindorff 1892: 728), [ts] being a German approximation to this sound.[37]

2.6.5.3 *Vocalic realization of consonant symbols*

The consonant symbols ‹ꜣ› and ‹ꜥ› are always realized as [a] (they were considered vocalic graphemes in early Egyptology). Some scholars recommend discriminating

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[36] I was told that ‹ṯ› could be heard as [ts] in Göttingen until the 1970s, but [tʃ] is the only pronunciation found there today.

[37] Proposed explanation by Frank Kammerzell (Göttingen).

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between both symbols by employing distinct vowel quantities (e.g. ‹ꜣ› as [a] and ‹ꜥ› as [aː] by Schenkel 1997a: 31, vice versa by de Buck 1967: 29), but most Egyptologists do not follow this suggestion.

Moreover, the consonant symbols ‹j› and ‹w› were considered vowel signs in earlier times; their original scholarly pronunciation must therefore have been [i] and [u] respectively. Today it is common to admit an alternative consonantal pronunciation as [w] ~ [v][38] for ‹w›. Aside from the fact that only [u] occurs in morpheme-final position (*hrw* "day" is ['hɛru], not [*'hɛrɛw]), exact distribution rules seem difficult or impossible to provide. In Göttingen, for example, *wḏ* "to command" is most frequently pronounced ['ʔuːtʃ], but *wr* "big" is pronounced ['wɛr] ~ ['vɛr] (which may sound like ['wɛʁ̞], ['vɛʁ̞]).

An analogous pronunciation of ‹j› as /j/ is found at only a few universities (*jnk* "I", most usually ['ʔiːnɛk], can be heard as ['jɛnɛk] in Heidelberg and Munich). A distinction between ‹i›, ‹y›, and ‹ï› is recommended e.g. by Schenkel (1997a: 31) (‹i› as [i]~[j], ‹y› as [iː]) but not practised by most Egyptologists.

The quality of vowels seems to be of little distinctive power in the speech of most German Egyptologists. In Göttingen, inserted *e* is always pronounced as a short [ɛ], but the other vowels are usually long: [aː], [iː], [uː]. At other universities, however, *e* may be long (☞ § 2.6.5.6), and *a*, *i*, *u* may be short (*wḏ* "to command" ['ʔŭtʃ], heard in Cologne).

At first sight, it seems striking that the consonantal pronunciation is rarer for ‹j› than for ‹w› since Germans can speak the sound [j] more easily than [w]. I assume that there is a historic reason for this: Whereas the sound value of ‹w› has been undisputed for a long time, many scholars have believed that ‹j› never or not always corresponded to /j/ in Egyptian (☞ § 2.6.3.2). This fact seems to have discouraged them to abandon the older pronunciation [i] in favor of [j].

2.6.5.4 e-insertion

According to a rule widely observed in the Egyptological scolarly pronunciation, no syllable can begin or end with a consonant cluster. This rule is curious since it has no parallel in the phonological structure of German.

It has not been recorded how Jean François Champollion, the decipherer of the hieroglyphs, coped with pronouncing difficult consonant clusters. However the fact that his mother tongue was French, a language in which [ə] often appears as a subphonological sound in consonant clusters, may suggest that he frequently inserted [ə] for ease of articulation. There are traditions from the 19th century which explicitly confirm that [ə] was used in the Egyptological pronunciation at that time (see Peust 1996: note 1 on p. 116f.). Today, however, the vowel [ɛ] is inserted which has no equivalent in the Egyptian writing nor in the transcription, e.g. *ns.t* "throne" ['nɛsɛt]. Syllabic sonorants, although common in German, are not usually employed (*qsn* "difficult" is ['kɛsɛn], not *['kɛsn̩]), but

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[38] The pronunciation [w] (or [β]) seems more frequent although this sound is foreign to German. Some persons, however, replace it by [v].

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vocalization of final atonic *-r* is frequent: *nfr* "good" ['nɛfɐ] besides ['nɛfɛɐ̯] or ['nɛfɛr].

If I am right in interpreting certain Egyptological written records from the 19th century as reflecting the scholarly pronunciation of that time, intrasyllabic consonant clusters did occur in the pronunciation (cf. transcriptions like *senṭ*[39] for *snḏ* "to be afraid", today spoken ['sɛnɛtʃ]). I propose that scholars like Kurt Sethe might have begun to avoid clusters in their pronunciation because they assumed a cluster restriction rule for Egyptian itself (☞ § 4.3).

e is not normally added at the beginning or at the end of a word. An exception is posed by words consisting of a single consonant, e.g. *n* "of" ['ʔɛn], *r* "to" ['ʔɛr] ~ ['ʔɛɐ̯], *z* "person" ['zɛ] ~ ['sɛ].

e-insertion is even found where it is not needed to split up consonant clusters. For example, *jmnw* "Amun (divine name)" is typically pronounced ['ʔi:mɛnu:] rather than [*'ʔi:mnu:] in Göttingen and probably at most other places.

2.6.5.5 *The role of morphology*

The morphemic structure of an Egyptian utterance influences its scholarly pronunciation (cf. Kammerzell 1995: XLI). For example, a glottal stop can be inserted at certain morpheme boundaries (e.g. noun or verb + suffix pronoun, verb + past-tense suffix *.n*), but not at certain others (e.g. noun + feminine gender suffix *.t*, noun + plural suffix *.w*). Word accent is phonologically relevant and mainly serves to indicate morphological distinctions. For example, some speakers realize *sḏm-f* as [sɛdʒɛm'ʔɛf] if it means "he may hear", but as ['sɛdʒɛmʔɛf] if it means "to hear him". For a detailed discussion see Peust (1996).

2.6.5.6 *Exceptions*

Some frequent words have irregular pronunciations which cannot be explained by rules like the above mentioned. At least some of these cases seem to be relics of more archaic habits of pronunciation. Examples:

- *ꜥnḫ* "to live" is usually pronounced ['ʔanx] ~ ['ʔanç] instead of expected [*'ʔa:nɛx] ~ [*'ʔa:neç].[40]
- At some universities, including Göttingen, certain pronouns are spoken with initial *e*. An example is *ntï* (relative pronoun) ['ʔɛnti:]. I have, however, heard the expected ['nɛti:] elsewhere.
- The verb *rḏj* "to give" used to be transcribed *rdj* which, at least in Göttingen, was pronounced ['ʔɛrdi:] ~ ['ʔɛɐ̯di:]. Along with the modern transcription, this irregular pronunciation has become obsolete: ['rɛdʒi:], not [*'ʔɛrdʒi:].

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[39] Brugsch (1867-1882: IV, 1256). See there also for numerous additional examples of this kind.

[40] This archaic pronunciation of *ꜥnḫ* was probably conserved due to its presence in well-known names such as *Tut-ankh-amun*.

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- The inserted *e* is usually pronounced short. This seems generally to be true for all German speaking universities, but the noun *nṯr* "god" is spoken with long *e*: at some places (e.g. ['neːtsɐ] in Vienna, ['neːtʃɐ] in Mainz; but ['nɛtʃɐ] in Göttingen).
- In Münster I found a pronunciation ['høɐ̯] or ['hœɐ̯][41] instead of the usual ['hɛɐ̯] for the frequent Egyptian preposition ‹ḥr› "on". I suggest that this [ø]-sound may ultimately be a substitution of [ə] which seems to have been in use in the Egyptological pronunciation in the 19th century (☞ § 2.6.5.4).

2.7 The Coptic alphabet

2.7.1 Introduction

The Copts adopted their alphabet from the Greek but added a few letters at its end to express specific Coptic sounds. With the possible exception of ϯ,[42] these additional letters were derived from Demotic, their forms having been slightly reshaped in appearance to make them fit nicely to the Greek letters. Whereas some Old Coptic texts incorporate quite a number of Demotic signs, including even logograms, their number was subsequently reduced to 7 in Bohairic and Akhmimic and to 6 in Sahidic. Ultimately, there are a few texts from the 8th century AD in which non-Greek letters are avoided altogether.[43] For a detailed overview about the several varieties of the Coptic alphabet that were in use see Kasser (1991b).

The order of the alphabet as well as the names of single letters are already attested in antiquity (this is not true for the letter ⳉ employed only in Akhmimic), for details ☞ § 2.7.3. The shapes of the characters were originally identical in the Coptic and the Greek alphabets. Over time, differences arose and the forms of both are quite distinct in modern typesetting. Whereas Classical Greek is printed today in letter forms adopted from Modern Greek, Coptic fonts are mostly modelled on very early manuscripts. A distinct series of capital letters is found in a minority of Coptic manuscripts only (☞ § 6.4.3), and I ignore them here.

With the emergence of Coptic our knowledge on Egyptian phonetics improves dramatically. Coptic is of eminent value for two reasons in particular:

1) Coptic lacks the semographic components of the older writing systems and thus omits certain kinds of information that these offered. Instead the phonetic representation is more elaborate, and the Coptic script systematically notes vowels and even attempts to indicate certain suprasegmental features.

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[41] Before /r/ (=[ɐ̯]), tense/ long vowels (such as /ø[ː]/) and lax/ short vowels (such as /œ/) are not distinguished in the local Westphalian dialect.

[42] The Demotic origin of the letter ϯ is doubted by Kasser (1984/85 and 1989: 111f.).

[43] Published by Crum (1940). Kasser & Shisha-Halevy (1991) treat them as a distinct Coptic dialect: "dialect G".

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2) The sound system of Later Egyptian becomes more and more difficult to examine due to an increasing complexity of grapho-phonemic relations (*historical orthography*). The Coptic script, at least in its beginning, is free of historical considerations.

2.7.2 The letters and their transcription

There is no standard system of transliterating Coptic letters. The following chart shows the transliteration/ transcription symbols used by some important scholars. In this book, Coptic words are not transliterated but accompanied by a phonological interpretation using IPA-symbols included in slashes / /.

	Greek model	STEINDORFF (1951: 11)	TILL (1955: § 11)	LAMBDIN (1982: X)	VERGOTE (1973/83: Ia, § 6)	VERNUS (1988)	SHISHA-HALEVY (1988: XVI)	POLOTSKY (1987/90)	LOPRIENO (1995: 25)
ⲁ	α	*a*	*a*	*a*	*á, à*	*a*	*a*	*a*	*a*
ⲃ	β	*b*	*b*	*b*	*b*	*b, v*[44]	*b*	*b*	*b*
ⲅ	γ	*g*	*g*	*g*	*g*	*g*	*g*	*g*	*g*
ⲇ	δ	*d*	*d*	*d*	*d*	*d*	*d*	*d*	*d*
ⲉ	ε	*e*	*ĕ*	*e*	*e, ə*	*e*	*e*	*e*	*e*
ⲍ	ζ	*z*	*z*	*z*	*z*	*z*	*z*	*z*	*z*
ⲏ	η	*ē*	*ē, ê*	*ē*	*ē*	*ē*	*ê*	*ê*	*ê*
ⲑ	ϑ	*th*	*th*	*th*	*th*	*ṯ*	*th*	*th*	*th*
ⲓ	ι	*i*	*i, j*	*i*	*ɿ, i, j*	*i, ɿ, j*	*i*	*i*	*i*
ⲕ	κ	*k*	*k*	*k*	*k*	*k*	*k*	*k*	*k*
ⲗ	λ	*l*	*l*	*l*	*l*	*l*	*l*	*l*	*l*
ⲙ	μ	*m*	*m*	*m*	*m*	*m*	*m*	*m*	*m*
ⲛ	ν	*n*	*n*	*n*	*n*	*n*	*n*	*n*	*n*
ⲝ	ξ	*ks*	*ks, x*	*ks*	*ks*	[45]	*ks*	*ks*	*ks*
ⲟ	ο	*o*	*ŏ*	*o*	*o*	*o*	*o*	*o*	*o*
ⲡ	π	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*
ⲣ	ρ	*r*	*r*	*r*	*r*	*r*	*r*	*r*	*r*
ⲥ	σ	*s*	*s*	*s*	*s*	*s*	*s*	*s*	*s*
ⲧ	τ	*t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*
ⲩ	υ	–	*u, w, y*	*u*	*y, w*	*y, ū, w*	*w, u*	*u, y*	*u*
ⲫ	φ	*ph*	*ph*	*ph*	*ph*		*ph*	*ph*	*ph*
ⲭ	χ	*kh*	*kh, ch*	*kh*	*kh*		*kh*	*kh*	*kh*
ⲯ	ψ	*ps*	*ps*	*ps*	*ps*		*ps*	*ps*	*ps*
ⲱ	ω	*ō*	*ō, ô*	*ō*	*ō*	*ō*	*ô*	*ô*	*ô*
ϣ	–	*š*	*š, sch*	*š*	*š*	*š*	*š*	*š*	*š*
ϥ	–	*f*	*f*	*f*	*f*	*f*	*f*	*f*	*f*
ⳉ	–	–	*ḫ, ch*	–	*x, ẖ*	–	–	*x*	*x*
ϧ	–	–	*ḫ, ch*	–	*x, ẖ*	–	–	–	*x*
ϩ	–	*h*	*h*	*h*	*h*	*h*	*h*	*h*	*h*
ϫ	–	*j, ž*	*č, tsch*	*j, ğ*	*č*	*č*	*j*	*j*	*j*
ϭ	–	*c*	*c, kj*	*č, c*	*čh, c*	*k'*	*c*	*c*	*c*
ϯ	–	*ti*	*ti*	*ti*	*tɿ, ti*	*ti*	*ti*	*ti*	*ti*

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44 Vernus seems to choose *v* when transliterating Greek loan words (cf. *vlapte*: VERNUS 1988: 204).

45 No example found in Vernus's data. The same for ⲫ, ⲭ, ⲯ.

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ϧ is used only in Bohairic, ⳉ only in Akhmimic. For this reason they are not found in all sources cited.

The Coptic alphabet includes digraphs representing a sequence of two phonemes. They cannot be used across a word boundary and can only be used to a limited extent across a morpheme boundary (for details ☞ § 6.4.7.1). ⲝ /ks/ and ⲯ /ps/ are adopted from the Greek alphabet. The aspirate signs ⲭ, ⲑ, and ⲫ (to which ϭ is to be added in Bohairic) can render monophonemic aspirate stops or biphonemic sequences *stop* + /h/ (for details ☞ §§ 3.3.2 and 3.3.3).

The exclusively Coptic sign ϯ is largely equivalent to a sequence of letters ⲧⲓ ~ ⲧⲉⲓ. ϯ is preferred for expressing /ti/ in native words. ⲧⲓ ~ ⲧⲉⲓ is used 1) if word boundaries or certain types of morpheme boundaries intervene (☞ § 6.4.7.1), 2) mostly in Greek loan words. I explain the function of the letter ϯ in greater detail in § 3.18.

2.7.3 The names of the Coptic letters

Each Coptic letter has a traditional name. The letters adopted from the Greek alphabet have names which are likewise borrowed from Greek. The additional letters which have been added at the end of the alphabet have names of obscure etymology.

The letter ⲋ, derived from Greek Ϝ (*digamma*), is solely employed as a numeral "6". It has no own name but is pronounced ⲥⲟⲟⲩ /ˈsɔw/, the Coptic numeral "6". For the letter ⳉ, only used in the Akhmimic dialect, no traditional name is known.

The names are cited below according to the following sources:

- The explicit renderings of the names which have been preserved from late antiquity and medieval times according to Crum (1939), Stern (1880: 7) and Kasser (1991b: 40).
- The pronunciation of the names recorded by Bernard de Breydenbach, *Relatio sanctarum peregrinationum*, 1486, a time when Coptic probably still was a living language (cited after Chaine 1933: 3). The transcriptions appear to be modeled after (older) German usage (*i* and *y* = [i], *ch* = [x], *sch* = [ʃ], *th* = [t], *v* = [f], *w* = [v]). *ey* is possibly to be read [ei] and not [ai] as it would be in modern German. Perhaps *s* in "syma" (ϭ) is to be read [ʃ] as in medieval German. The rendering of final ⲩ as *-ff* is curious.
- The pronunciation recorded by Rochemonteix (1892: 98f.) in Isna, Upper Egypt. He uses a unique transcription which I have attempted to transform into IPA-symbols.
- The pronunciation recorded by Prince (1902: 291f.) in Aswān, Upper Egypt. I reproduce Prince's transcription symbols as they are (replacing the length indicator ˆ by ˉ).
- An Arabic transcription of the traditional pronunciation made by an inhabitant of Luxor, Upper Egypt, at the end of the 19th century (cited by Stern 1880: 418). I give a transliteration of the Arabic. Note that ‹ʔ› may indicate both /ʔ/ and /a:/; ‹y› may

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indicate /y/, /iː/, and /eː/; ‹w› may indicate /w/, /uː/, and /oː/. Word-final ‹h› indicates /a/. Other short vowels are indicated only rarely. Consonant length is not expressed in the Arabic writing.

- The pronunciation recorded by Vycichl in Luxor. The list appears in Vycichl (1990: 30f.), but the data were obviously collected already in the 1930s, cf. Vycichl (1983: 154, 243). I reproduce his transcription without change; both ȝ and ʾ mean [ʔ].
- The pronunciation recorded by Worrell & Vycichl (1942: 314-327) in the Upper Egyptian village Zēnīya. I give their transcription without alteration.
- The so-called "reformed pronunciation" (☞ § 2.2) used by Copts in modern Egypt. Whereas all preceding name forms are based on the indigenous tradition, this modern pronunciation is heavily influenced by the names of the letters in modern Greek. My source is Ishaq (1972: I, 9f., 13, 16 and II, 12f.), a small book intended to revive Coptic as a living language which has been revised by Pope Shenouda III, the highest authority of the present day Coptic church. The pronunciation is indicated in Arabic script which is partly, but not completely supplied with vocalization marks. I indicate my phonetic interpretation of the Arabic in the very right column. My transcription of و as *o:* (rather than *u:*) in the names of the letters ⲓ and ϩ is based on what I heard from Muḥammad Sharīf ʿAlī (Cairo) and Shirly Sedhom (Göttingen). Some other details of the intended pronunciation remain obscure.

Similar modernized forms are also given by Mallon (1956: 9), a Bohairic grammar which has been very influential in Egypt.

Letter	Coptic writing	1486	1892, Isna	1902, Aswan	Arabic transcr., Luxor	Vycichl's records, Luxor	1942, Zeniya	1972	
ⲁ	ⲁⲗⲫⲁ	alpha	alfa	álfā	ʔlfh	ȝalfa	alfa	ألفا	ʔalfa
ⲃ	ⲃⲏⲧⲁ, ⲃⲓⲇⲁ	weda	βeδa	vídā	wyḍh	wīḍa	bēda, vēda	ڤيتا	vi:ta
ⲅ	ⲅⲁⲙⲙⲁ	gamma	γamma	ġámmä	γmh	ġamma	ġamma	غمّا	γamma
ⲇ	ⲇⲁⲗⲇⲁ	delda	dalda	dáldä	dlḍh	ḍalḍa	dalda	ذِلتا	zilta
ⲉ	ⲉⲓ	e	ɛiɛ	éīyĕ	ʔyh	ʾeyya	ēјɛ	إِي	(?)
ⲋ	–	zso	so	sō	sw	–	–	سُو ~ سوو	suww
ⲍ	ⲍⲏⲧⲁ, ⲍⲓⲧⲁ	sytta	dza:da	zádā	zʔdh	zīda	zāda	زيتا	zi:ta
ⲏ	ⲏ(ⲓ)ⲧⲁ, ϩⲏⲧⲁ	heda	hada	hádā	hʔdh	hīda	hāda	إيتا	ʔi:ta
ⲑ	ⲑⲏⲧⲁ, ⲑⲓⲧⲁ	theda	ti:δa ~ tɛtta	tĭttā	tth	titta	tútte	ثيتا	si:ta
ⲓ	ⲓⲱⲧⲁ,ⲓⲁⲩⲇⲁ	ioda	ioda	iṓdā	ywḍh	yōḍa	jōda	يوتا	jo:ta
ⲕ	ⲕⲁⲡ(ⲡ)ⲁ	caba	kabba	kábbā	kbh	kabba	kabba	كَبَّا	kabba
ⲗ	ⲗⲁⲩⲇⲁ, ⲗⲁⲩⲗⲁ	lauda	lola	lōla	lwlh	lōla	lōla	لُولَّا	lulla
ⲙ	ⲙⲏ, ⲙⲉ, ⲙⲓ	men	mi	mī	myh	mī	mēj	مِيْ	mijj
ⲛ	ⲛⲉ, ⲛⲓ, ⲛⲛⲏ	nyn	ni	nī	nyh	nī	niʾ	نِيْ	nijj

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ⲝ	ⲝⲓ	axi	εksi	äksí	ʔksy	éksi	εksí	إكسى	ʔiksi
ⲟ	ⲟⲩ, ⲟ	off	ɔw	ōŭ	ʔuww	ȝoʿ (*sic!*)	ōw	أوْ	ʔuww
ⲡ	ⲡⲓ	by	bi	vɪ	by	bɪ	bej	بى	pijj
ⲣ	ⲣⲟ, ϩⲣⲟ, ⲣⲱ	ru	ru:	rṓŭ	ruww	rō	rōw	رو	ruww
ⲥ	ⲥⲓⲙⲁ, ⲥⲩⲙⲙⲁ, ⲥⲏⲙⲙⲁ	syma	samma	sámmā	smh	samma	sámma	سيما	si:ma
ⲧ	ⲧⲁⲩ	thaff	daw	dāʾu	ḍʔw	ḍāw	daū (*sic!*)	تاف	ta:v
ⲩ	ϩⲉ, ⲩⲉ	he	hε	hē	h-[46]	he	ha, hε	إبسلن	(?)
ⲫ	ⲫⲓ	ffy	fi	fɪɪ	fy	fɪ	fɪj	فى	fijj
ⲭ	ⲭⲓ	chy	xi	kɪ	ky	kɪ	kij	كى	kijj
ⲯ	ⲯⲓ	ebsi	εpsi	äpsí	ʔbsy	ébsi	ébsi	إبسى	ʔibsi
ⲱ	ⲱ, ⲁⲩ	o	ɑ	ō	ʔaww	ȝō	ōʾ	أوو	(?)
ϣ	ϣⲁⲓ, ϣⲉⲓ	schey	ʃaj	šā́ĭ	šʔy	šāy	šaj	شاى	ʃa:j
ϥ	ϥⲁⲓ, ϥ(ⲏ)ⲉⲓ	vey	faj	fāĭ	fʔy	fāy	fāj	فاى	fa:j
ϧ	ϧⲁⲓ, ϧⲉⲓ	hachi	xaj	ẖēĭ	xʔy	xāy	ẖāj	خاى	xa:j
ϩ	ϩⲟⲣⲓ, ϩⲱⲣⲉⲓ	hori	hori	hṓrɪ	hwry	hōri	hōri	هورى	ho:ri
ϫ	ϫⲁⲛϫⲓⲁ	gensa	ɟenɟa	d͡yánd͡ya	ǧʔnǧh	ǧanǧa	ɟánɟa	جنجا	(?)
ϭ	ϭⲓⲙⲁ	syma	ʃima	šímā	šymʔ	šɪma	šɪma	إتشيما	ʔitʃi:ma
ϯ	ⲧⲓ, ϯⲉⲓ	ty	di	dɪ	dy	dɪ	dɪj, dɪ, di	تى	ti:

2.7.4 The digraphs ⲉⲓ and ⲟⲩ

In Hellenistic Greek, the letter combination ει can be used as a mere graphic variety of ι /i/, and ου serves to express /u/. This use has been adopted into Coptic where ⲉⲓ can express a single phonetic segment /i/ or /j/[47], and ⲟⲩ can express /u/ or /w/.

It is difficult to give exact rules for the use of digraphs. Coptic manuscripts show much variation in this respect, and there has been little research on the topic so far (but cf.

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[46] One or more following letters irrecognizable due to a printing error.

[47] The assumption that in most Coptic dialects ⲉⲓ can be used as a digraph with the same sound value as ⲓ has been asserted by almost all scholars. To the best of my knowledge, the single exception is Kasser (1997: 6) who suggests that ⲉⲓ always renders a kind of diphthong (in Kasser's transcription /əí/, /éj/ or /əj/) as opposed to ⲓ denoting /i/ or /j/. If this assumption is true, some phenomena which are considered graphical here would have to be reinterpreted as phonological. It would become necessary, for example, to assume sound changes such as /j/ > /əj/ (or similarly) in word-initial position for Sahidic. Certain graphical phenomena would perhaps become somewhat hard to explain, such as the writing ^{s}ⲁⲓ instead of "normal" ^{s}ⲁⲓⲉⲓ "I came" (see Quecke 1984a: 45). While traditionally it would be held that /a'ji/ was somewhat imprecisely rendered as /a'i/, Kasser would have to argue that /ai/ varies with something like /aiei/. Another question which could be posed would be how to explain the writing ⲉⲉⲓ which at present is interpreted as /εj/, /əj/. But further discussions of Kasser's proposal are necessary.

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Quecke 1984b). Only a few general remarks concerning Sahidic and Bohairic literary manuscripts follow:

- The digraph ⲉⲓ is not employed in Bohairic (i.e.: ⲉⲓ in Bohairic always renders a phonemic sequence).
- In Sahidic, ⲓ is preferred after consonants, although ⲉⲓ can occur as well. After vowels, both ⲓ and ⲉⲓ are frequent. Ernštedt (1986: 72) suggests that the amount of free space in the line plays a role here.
- In both Sahidic and Bohairic, ⲟⲩ is the only way to express /u/ or /w/ in most environments. After ⲁ and ⲉ (in Sahidic also after ⲏ), however, a single ⲩ often appears.
- A preceding word or morpheme boundary may favor using a digraph. In Sahidic, for example, single ⲓ or ⲩ is never used word-initially. Cf. also § 6.4.7.1.
- Additionally, the choice may be influenced by phonological criteria. In Bohairic, for example, ⲟⲩ after ⲁ and ⲉ seems to occur preferably in the onset of a stressed syllable, e.g. ⲁⲟⲩⲱ /a'wo/ "pledge", but ⲙⲉⲩⲓ /'mɛwi/ "to think". In Sahidic, some scribes attempt to make a difference between (ⲟ)ⲩⲉⲓ /wi/ and ⲟⲩⲓ /uj/: ⲟⲩⲉⲓⲛⲉ /'winə/ "to pass by", ⲁⲩⲉⲓⲛ /a'win/ "cargo", ⲕⲟⲩⲓ ~ ⲕⲟⲩⲉⲓ /'kuj/ "little", ⲧⲟⲩⲓⲟ ~ ⲧⲟⲩⲉⲓⲟ /tu'jɔ/ "to repay".

2.7.5 The superlinear stroke in Sahidic-Coptic writing

Coptic texts can contain several types of diacritic signs (on Coptic diacritics in general ☞ § 6.4.3). In the following, I discuss the superlinear stroke. This sign is typical for Sahidic and is the most frequently used diacritic of this dialect. By contrast, Bohairic has no superlinear stroke. Instead it uses the so-called "djinkim", a superposed point or small vertikal stroke. The "djinkim" seems to have a quite different function[48] and, according to Kasser (1972), is historically unrelated to the Sahidic stroke. There are also specific diacritics in other dialects.[49]

The Sahidic superlinear stroke is a horizontal stroke which is written above the line and not clearly attached to a single letter. The stroke may be superposed on one letter, be written above the line somewhere between two letters, or may be so long as to cover the length of up to four letters. (On the various possibilities for position and length of the stroke cf. Kasser 1965/66: 100f. and Polotsky 1957b: 223f.). Although there has been some discussion about this sign, its function is still rather unclear. Research is hindered by the fact that Coptic diacritics are often rendered inaccurately in text editions. This may be due to a lack of interest in rendering signs whose function is so little known, or else typographical obstacles may not allow the text editor to indicate their exact position and form. The major Coptic dictionaries do not render diacritics at all.

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[48] On the "djinkim" see Polotsky (1946-47), Kasser (1991c and 1994a), Depuydt (1993: 359-362).

[49] Cf. e.g. Kasser (1976-78) for diacritics in Mesokemic.

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The Sahidic superlinear stroke marks letters which are employed as numerals (e.g. ⲅ̄ "3") and abbreviations of certain religious terms (e.g. ⲡ̄ⲛ̄ⲁ̄ = ⲡⲛⲉⲩⲙⲁ "spirit"). This is not its prototypical function and will be excluded from our further discussion.

In its usual function, the superlinear stroke is found above consonants, particularly those in consonant clusters. It is unknown to what degree the stroke is predictable. Many manuscripts seem not to use it consistently. There is nothing in Egyptian etymological cognates nor in Coptic loans in Arabic which corresponds to the stroke. Let us have a look at the main opinions that have been expressed to date:

- The traditional opinion holds that the superlinear stroke is equivalent or at least functionally similar to the letter ⲉ. This is still reflected in the modern scholarly pronunciation at western universities: ⲛ̄ⲥⲁ "after" is usually spoken [ən'sa] ~ [en'sa] (or similarly), ⲥⲱⲧ̄ⲡ "to choose" is spoken ['so:təp] ~ ['so:tep]. The same is reflected in early grammars such as Tattam (1863: 7) who says: "When the line in Coptic[50] (`) or the horizontal line in Sah. (¯) occurs over consonants, it generally expresses the vowel ⲉ".

  This view results from the observation that in certain environments supralinear diacritics alternate with ⲉ throughout the same text, more frequently throughout different dialects or diachronic stages of the language. Late Coptic, and thus the pronunciation which can be heard from modern Copts, is a variety that most frequently has a vowel where in Sahidic a superlinear stroke is (or may be) written.
- Till (1932) is one of the main proponents of the view that the stroke is a vowel indicator. He assumes that it serves to express a specific reduced vowel ("Murmelvokal") which he transcribes ^{e} (in Till 1951 he changes the transcription to ï). In his opinion, a kind of vocalic interpretation is necessary since there are consonantal sequences such as ^{a}ⲛ̄ⲛ̄ⲛ̄ⲛⲁⲃⲉ "our sins (accusative)" which can only be pronounced when split up by vocalic elements, and these are what the superlinear strokes indicate. In Till (1951) he adds another argument to support his view: The Coptic prefix ⲛ (plural article and genitive marker) is assimilated to ⲙ when preceding ⲙ as a single consonant, but not when preceding ⲙ in certain graphical consonant clusters where superlinear strokes are likely to appear: e.g. ^{s}ⲙ-ⲙⲏⲥⲉ "the interests" (for *ⲛ-ⲙⲏⲥⲉ), but ^{s}ⲛ-ⲙ̄ⲗⲟⲟϩ "the fights" (on this assimilation and my interpretation ☞ § 3.16.1). He states that the failure of assimilation in the latter case can only be due to an intervening vowel, so both groups were pronounced *ïm-mêse* and *ïn-ïmlóoh*, respectively. I argue, however, that it is enough to assume a distinction between a consonantal and a syllabic sonorant here. These sounds can easily have behaved differently with respect to assimilation.
- Worrell (1934[51]: 11-16, 129) is the first to clearly have expressed the opinion that

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[50] "Coptic" is used here in the sense of "Bohairic". Tattam is speaking of the *djinkim*.

[51] The first fascicle of his book appeared a few years before 1934, so he antedates Polotsky (1933).

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the superlinear stroke does not represent a vowel. He explains its occurrence above consonant clusters by the assumption that the stroke serves to clarify the syllabic division of utterances. In his opinion, syllables which have a vocalic nucleus are sufficiently marked as such by the vowel letters, but syllables with a consonantal nucleus need a specific notational device for their identification, namely the stroke. Worrell's hypothesis implies that different stroke positions could produce contrasts in graphical groups which allow for more than one syllabic division, but he does not provide a minimal pair.
However, the stroke also appears in cases like ⲥⲱⲗⲡ̄ "to break", ⲥⲱⲧⲡ̄ "to choose", ⲧ̄ⲧⲟ "the portion", or ϫⲟⲕ̄ⲕ "to perfect you", where it seems improbable that there was a second syllable in addition to the syllable containing the vocalic nucleus. For cases like these, Worrell (1934: 15f.) considers the possibility that even a stop can constitute a syllable on its own in Coptic, but he also admits that the use of the stroke might by analogy have been extended to consonant clusters which do not actually constitute a syllable on their own.

- Polotsky (1933) supports Worrells point of view. He argues that graphical variation of the stroke and ⲉ, which had always been an argument in favor of the vocalic interpretation of the stroke, is restricted to specific contexts, where it can be interpreted as phonetic rather than graphical variation. On the other hand, the existence of contexts in which a stroke never alternates with ⲉ shows that a general interpretation of the stroke as a vowel indicator is implausible. Polotsky remarks that in infinitives of the type ⲤⲰⲤⲤ̄ (the second consonant being an obstruent) with or without suffixes the stroke is never replaced by ⲉ (ⲥⲱⲧⲡ̄ "to choose", ⲥⲟⲧⲡ̄ϥ "to choose him", ⲥⲟⲧⲡⲟⲩ "to choose them"), whereas in comparable verbs where the second consonant is a sonorant the stroke and ⲉ may alternate unless a vocalic suffix follows: ⲥⲱⲗⲡ̄ ~ ⲥⲱⲗⲉⲡ "to break", ⲥⲟⲗⲡ̄ϥ ~ ⲥⲟⲗⲉⲡϥ "to break him", ⲥⲟⲗⲡⲟⲩ (but not *ⲥⲟⲗⲉⲡⲟⲩ) "to break them". Therefore ⲉ is evoked by the sonorant rather than being a general device of the Coptic language to split up consonant clusters.
  In Polotsky (1957b: 221-225) he adds another argument. The superlinear stroke is distinct in character from all alphabetic signs. It is not arranged into a relative order along with other signs but is superposed to varying numbers of letters. According to Polotsky, this indicates that the stroke is a prosodical (we would say in modern terminology: suprasegmental) element rather than indicating a specific phoneme. He argues that the stroke basically indicates syllables, and whether consonant clusters were broken up by epenthetic vowels or not, these at least are not what the stroke serves to express. Polotsky (1957b: 224) cites a contrast involving stroke length which he found in certain Sahidic manuscripts: ⲙ̄ⲛⲧⲣⲉ "witness" – ⲙ̄ⲛ̄ⲧ- (nominal prefix). In his opinion, this reflects a difference in syllabification.
- Kasser (1965/66) tries to reconciliate the opinions of both sides and argues that the superlinear stroke, for which he invents the French term *surligne*, can alternatively – especially if it is comparatively long – indicate syllable boundaries, or else –

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especially if it is comparatively short – indicate an intrusive segment which might have been vocalic in nature, but might also have came close to a syllabic sonorant ("Murmelkonsonant").

- Nagel (1966) adopts Polotsky's view and refines it by asserting that any consonant including obstruents can in principle form the nucleus of a syllable.
- Vergote (1973/83: Ia, § 68 and Ib, § 40) considers the stroke principally a syllable indicator. The syllable can be formed either by adding a weak vowel in pronunciation ($ə_1$ in Vergote's transcription) or by using a sonorant as a syllable nucleus (he notes the vocalic function of the sonorant by the abstract symbol $ə_2$). (Cf. already Vergote 1954b: 105).
- Hintze (1980: 73-77) develops an abstract phonological representation of Coptic which is supradialectal and serves as a deep structure from which dialectal divergences as well as intradialectal morphophonological variation of Coptic can be derived. In this deep structure, he does not admit consonant clusters within a syllable but posits a phoneme /ə/ in many places where in Sahidic the superlinear stroke is written.
- Depuydt (1985a: 133f.) follows Worrell's and Polotsky's view and states:

  > " (...) the superlinear stroke is a syllabic marker: it is placed over consonants that serve in place of a vowel as a sonorous center, and it extends backward or forward so as to include in part a preceding or succeeding letter belonging to the same syllable".

  He does not clarify which factors determine the exact extension of the stroke. As is elaborated in detail in Depuydt (1993: 341, 352f.), he sees no difficulty for any consonant in Coptic to be potentially a syllable nucleus. Just as Worrell did, he considers the superlinear stroke as a means of guiding the reader towards the correct syllabification, which is especially needed since Coptic texts lack word division (Depuydt 1993: 358f.).
- Vycichl (1990: 203-207) likewise subscribes to the view that the superlinear stroke is a syllabic marker, and that any consonant may be a syllable nucleus in Coptic. He argues that assimilatory effects as evidenced by renderings like ^{s}ⲘⲞⲨⲚⲄ (ⲘⲞⲨⲚ̄Ⲅ̄) (besides ^{s}ⲘⲞⲨⲚⲔ) (on this ☞ § 3.3.7) indicate that Ⲛ was in direct contact with the following velar plosive, so the word was pronounced disyllabically as *mu:–nk* (and not ...*nək* or similarly). This changes, however, in the later stages of Coptic:

  > "Souvent une voyelle brève et peut-être ultrabrève s'insère devant une consonne syllabique [...]. Le *timbre* des voyelles développées ultérieurement est mal connu et n'était certainement pas le même dans toutes les parties du pays." (Vycichl 1990: 207).

In sum, we have to state that neither the interpretation of the superlinear stroke as a vowel sign nor as a syllabic marker is proven. For some additional evidence against its interpretation as a syllabic marker ☞ § 6.4.7.2. The syllable is in principle an

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independent category. Syllable boundaries cannot be automatically determined based on a given succession of phonemes, and as long as no independent parameter for determining syllable boundaries has been found, any attempt to relate the superlinear stroke to syllables must be considered highly hypothetical. At the present stage of knowledge, we cannot tell whether the features rendered by the superlinear stroke are phonologically relevant or not. The possibility should be kept in mind that the superlinear stroke may have no phonetic relevance at all but may rather be a morphological or segmentational marker. In many cases, the stroke seems to graphically "connect" clusters of consonants belonging to the same word, which makes it an indicator of word boundaries. Detailed examinations of Coptic diacritics based on original manuscripts or photographs are still necessary. I neglect superlinear strokes in the rest of this book and do not indicate any diacritics when rendering Coptic words or phrases.

2.8 How to use an Egyptian or Coptic dictionary

2.8.1 Egyptian dictionaries

The ancient Egyptians had a conventional order of arranging the consonants of their language. This order is known imperfectly from certain badly preserved didactical papyri of the Late Period. Following Quack's (1993: 145) reasoning, the Egyptian order is to be reconstructed as follows:
‹h›, ‹ḥ›, ‹w›, ‹s›, ‹b›, ‹n›, ‹ḫ›, ‹ḏ›, ‹p›, ‹ꜥ›, ‹g›, ‹ỉ›, ‹q› (omitting all consonants for which the position is questionable). This sequence seems to be related to the *h – l – ḥ* – ...-alphabet known from Old South Arabic, but also from certain archaic North-West Semitic sources (Tropper 1996), whereas in the first millennium BC another sequence *ʾ – b – g* – ... became popular in the North-West Semitic area, on which the order of the Latin alphabet is ultimately based. Tropper (1996) therefore assumes that the Egyptians adopted their alphabetic sequence from a Semitic script in the late 2nd millennium BC. Kammerzell (1996: 13-22 and 1998c), however, discovers that this sequence is at least partly explainable from a phonological principle as soon as the sound values of Old or Middle Egyptian are applied. He draws the conclusion that the sequence was developed in Egypt and subsequently exported into Semitic speaking areas.
In Egyptian dictionaries, words are arranged by their conventional transcription. Egyptologists have developed a specific arrangement of their transcription alphabet which is applied in all current dictionaries. This order is shown in § 2.6.2. It is neither identical to the arrangement of the Egyptian, the Latin, nor of any other alphabet but has been formed by several accidental decisions made during the development of Egyptology (on this topic see Schenkel 1988).
The vowels, which are often unknown to us anyway, are disregarded in the arrangement of words in the dictionaries. The subarrangement of words sharing the same consonantal

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pattern does not follow a strict principle; one usually groups together words with a common writing and/ or etymology. Most dictionaries (Wilson 1997 being an exception) do not consider suffixes such as the feminine ending *.t* for the arrangement of words.

Since there is extensive writing variation in Egyptian texts, some general experience and knowledge of sound development rules is needed in order to locate an actual word form in a dictionary. In dictionaries covering several diachronic periods, words are usually recorded by their most ancient form.

2.8.2 Coptic dictionaries

On the order of the Coptic alphabet ☞ § 2.7.1.

Coptic dictionaries arrange their lemmata primarily with regard to their consonants, just as dictionaries of Egyptian and Semitic languages do. Initial vowels are counted like consonants, i.e. words beginning with a vowel are arranged by it. The treatment of the following letters or letter combinations requires attention:

- The digraphs ⲉⲓ and ⲟⲩ are mostly treated like single ⲓ and ⲩ. These letters or letter combinations may be considered in the arrangement of words or not, depending on whether they are supposed to render consonants (/j/, /w/) or vowels (/i/, /u/) respectively. Note that Crum (1939) and Mallon (1956) never treat (ⲉ)ⲓ as a consonant. Examples: ⲉⲓⲟⲙ /'jɔm/ "sea" is arranged under ⲓ–ⲙ, ⲙⲉⲉⲩⲉ /'mɛːwə/ "to think" under ⲙ–ⲩ, ⲙⲁⲉⲓⲛ /'majn/ "sign" under ⲙ–ⲓ–ⲛ or ⲙ–ⲛ.
- Letters that represent a sequence of two phonemes are frequently analyzed. In most dictionaries (Vycichl 1983 being an exception) we have to look up ⲝⲟⲩⲣ /'ksur/ "ring" under ⲕ–ⲥ–ⲣ, ⲯⲓⲥ /'psis/ "9" under ⲡ–ⲥ–ⲥ, and ϯⲙⲉ /'timə/ "village" under ⲧ–ⲙ.
- Aspirate signs are treated the same way in the dialects in which they denote a phonemic sequence, e.g. Sahidic ⲑⲃⲃⲓⲟ /thβ'jɔ/ "to humiliate" has to be looked up under ⲧ–ϩ–ⲃ–ⲃ–(ⲓ). In the Bohairic dialect aspirates are monophonemic; if Bohairic words are registered in a dictionary, ⲫ, ⲑ, and ⲭ may be arranged at their alphabetical position (e.g. Crum 1939, Vycichl 1983) or at the position of their Sahidic equivalents ⲡ, ⲧ, and ⲕ (e.g. Mallon 1956, Westendorf 1965/1977).

In the subarrangement of words which share the same consonantal pattern, words are primarily ordered according to their syllable structure, e.g. for biconsonantal words, the order is C(V)C, CVCV, CCV in Crum (1939), and CC, CCV, CVC(V) in Westendorf (1965/1977). Words of identical syllable structure are subarranged according to their vowels.

The glossary of Lambdin (1982: 209-358) applies a strictly alphabetical order as is common for European languages.

Coptic dictionaries usually cover more than one dialect. The lemmata are traditionally arranged by the Sahidic form (if existent). For this reason, some knowledge of the basic dialectal sound and writing peculiarities is essential to find words of other dialects (e.g.

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Bohairic ⲑⲓϧⲓ /ˈtʰixi/ "to get drunk" must be looked up under the Sahidic writing ϯϩⲉ /ˈtihə/, i.e. unter the consonants ⲧ–ϩ). In some difficult cases, dictionaries may provide cross-references.

Unfortunately, the immense number of Greek borrowings are not included in any Coptic dictionary apart from the incomplete Kasser (1967). There are only short glossaries of Greek borrowings in Böhlig (1954: index volume), Lambdin (1982: 359-363), Mallon (1956: 202-214), Wessely (1910: 20-37) and concordances such as Lefort (1950) and Bauer (1975). Greek words usually have to be looked up in Greek dictionaries which creates difficulties at times since not only their writing and inflexion is often different from the Greek, but several of them also experienced some semantic change in the process of borrowing.

2.9 Borrowings from Egyptian and rendering Egyptian speech in foreign scripts

Transcriptions of Egyptian words in foreign scripts and vice versa provide one of the main clues for investigating Egyptian phonology. On the other hand, Egyptian evidence can be valuable for investigating phonological topics in other ancient languages. In the following sections, I have attempted to collect some of the most important sources.

2.9.1 Akkadian and cuneiform texts

The first foreign texts to transcribe Egyptian words and phrases are cuneiform documents in the Akkadian language (for the most part in dialects related to Middle Babylonian) from the 2nd millenium BC which had been sent as letters from or to Egypt. They were found at two sites, namely Tell el-Amarna (14th century BC, Middle Egypt) and Boğazköy (13th century BC, Asia minor). Additionally, the Late Egyptian phrase *nꜣ-msḥ.w* "the crocodiles" is rendered in a Middle Babylonian cuneiform text from the 15th century BC (Lambdin 1953c). In these early sources, no less than about one hundred different Egyptian lexemes have been identified. Whereas most of these words are probably taken from Late Egyptian, some of them, especially royal names, are based on (Neo-)Middle Egyptian, so they might demand a different phonological interpretation (cf. Vergote 1973/83: Ib, §§ 48, 50, 55, 62-64). For an illustration of transcriptions from Tell el-Amarna ☞ § 5.5.2 and appendix 3. Following a period of silence, cuneiform sources written in the Neo-Assyrian and Neo-Babylonian dialects of Akkadian provide extensive Egyptian onomastic material again in the mid 1st millennium BC.

Vergote (1973/83: Ib, 84-101; cf. also his bibliographical notes on p. 53-55) has assembled much of this cuneiform material. For additions see Albright (1937), Bongenaar & Haring (1994), Cochavi-Rainey (1997), Edel (1975, 1980, 1989, and 1994b: II, 360-372), Joannès (1984), Lambdin (1953b), Leahy (1983 and 1993), Osing (1987), Starke (1981: 229),

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Vittmann (1984), Wiseman (1966), Zadok (1977, 1983, and 1992), and Zeidler (1994).
The Akkadian language and script was also employed by Egyptian scribes for the purpose of international communication during the time of the New Kingdom. It is quite natural that numerous instances of grammatical influence and loan translations from Egyptian can be found in these texts (cf. e.g. Cochavi-Rainey 1990 and 1997, Kammerzell 1998b: 228-232).

There is an Egyptian text from the New Kingdom in which the hieroglyphic sign 𓈗 (semogram "water") is replaced by the functionally corresponding cuneiform sign (Legrain 1908).

2.9.2 North-West Semitic languages and scripts

North-West Semitic languages were recorded in alphabetic scripts which fail to express vowels, but there are important distinctions in the consonantal inventory absent in most other scripts (e.g. /ʕ/ and /h/ cannot clearly be expressed in the cuneiform nor in the Greek documents).

The Hebrew Old Testament contains several Egyptian names, words, and phrases in Hebrew transcription. It is difficult to establish the exact time when they were recorded. A long time after its composition, the Hebrew text was supplied with vowel marks. It seems probable that they are unreliable with respect to foreign words and names, unless they were borrowings which lived on in the language.

Egyptian loan words in Biblical Hebrew and other ancient Semitic languages have been collected by Lambdin (1953a); for additions see Görg (1975, 1985, and 1992). Vycichl (1940) discusses Egyptian place names in the Hebrew Bible. For Hebrew transcriptions of Egyptian names see also Stricker (1937: 6-13). The Egyptian noun *zšn* (originally perhaps *zššn*[52]) "lotus-flower" was borrowed into Hebrew as שׁוּשַׁן, whence a female proper name שׁוֹשַׁנָּה was derived which is the etymological source of the English proper name "Susan" (Gardiner 1936: 189f.).

A large corpus of Aramaic documents written by Jewish settlers in Egypt exists dating from the mid 1st millennium BC. These documents contain Egyptian words, especially proper names, in Aramaic transcription. Many such names can be found in Vittmann (1989a: 226-229) and Zauzich (1985). On Egyptian borrowings into Aramaic see Couroyer (1954). For some more Egyptian words in Aramaic transcription see Vittmann (1993) and Quack (1992b). The Aramaic texts from Egypt also contain loan translations (calques) from Egyptian; they are discussed by Leibovitch (1935f.).

There are renderings of Egyptian words in other, less well known Semitic languages and scripts such as Ugaritic (late 2nd millennium BC) and Phoenician (1st millennium BC). Egyptian loans in Ugaritic have been compiled by Watson (1995: 544-546 and 1996: 705-

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[52] It is not clear whether *zššn* is an early form of *zšn* or whether it is another word. Osing (1976a: note 1262 on p. 851) opts for the latter possibility.

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708). On Egyptian proper names in Phoenician transcription see Vittmann (1989b). Muchiki (1994) proposes several Egyptian borrowings and identifications of Egyptian proper names in Hebrew, Aramaic, and Phoenician.

2.9.3 South Semitic languages and scripts

Contacts between Egyptians and speakers of Old South Arabian languages have also been found to have existed. A Minaean inscription found in Egypt transcribes four Egyptian and Graeco-Egyptian expressions: *ḥw.t-ḥrw* (> ^{s}ϩⲁⲑⲱⲣ) (month name) as *ḥtḥr*, *kꜣ-ḥr-kꜣ* (> ^{s}ⲕⲟⲓⲁϩⲕ) (month name) as *kjḥk*, *ꜣsjr-ḥp* "Serapis (god)" as *ʾṯrḥp*, and "Ptolemaios" as *tlmjṯ* (Ryckmans 1935: no. 3427). Müller & Vittmann (1993) discuss a few proper names in other Minaean inscriptions which might be Egyptian. There is also a transcription of the Egyptian month name *pꜣ n ḫnsw* (> ^{s}ⲡⲁϣⲟⲛⲥ) as *pḥnśj* in a Nabataean inscription (Strugnell 1959: 32).

Borrowings from Coptic are found in Gəʿəz, the classical literary language of Ethiopia. Manfred Kropp (Mainz) is currently preparing a publication on this topic.

There are late sources rendering Coptic in Gəʿəz script which were published by Strelcyn (1957). The most important of these documents is a trilingual (Bohairic) Coptic – Arabic – Gəʿəz glossary covering 268 words from approximately the early 18th century AD. The words of all three languages are rendered in Gəʿəz script.

2.9.4 Arabic

After the Arabic language had settled in Egypt, the local Arabic dialect absorbed a certain number of Coptic words. These words are often very provincial, and most of them are restricted to semantic fields such as agriculture and nature. Since the Egyptian Arabic vernacular is usually unwritten and was so in the past, it is impossible to determine at which time a specific word was borrowed. Samples of such loans can be found in appendices 6 and 8.

The most important studies to deal with Coptic borrowings into modern Egyptian Arabic are Vittmann (1991) (a recent compilation of Coptic loans cited in the comprehensive dictionary of the Cairene dialect by Hinds & Badawi 1986, with critical evaluation of the proposed etymologies and references to the relevant literature), Behnstedt (1997) (with further comments on the material discussed by Vittmann 1991), Behnstedt (1981) (a careful collection of Coptic words especially from the agricultural sphere recorded in field studies throughout the country; these words often do not figure in the dictionary by Hinds & Badawi 1986 since they are not used in Cairo), and Bishai 1964 (additional source for Coptic words found in areas other than Cairo; since Bishai does not cite the geographical provenance of most words it is sometimes impossible to interpret his transcriptions phonologically).

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A few words were borrowed not only into Egyptian Arabic but into Arabic in general, which probably implies a very early date of borrowing. Examples:

- *timsāḥ* "crocodile" < ^{s}ⲙⲥⲁϩ, ^{b}ⲉⲙⲥⲁϩ probably together with the feminine definite Article ⲧ-, although the word is of masculine gender in Coptic (on this problem see Vycichl 1983: 123).
- *ṭūba* "brick" < ^{s}ⲧⲱⲱⲃⲉ, ^{b}ⲧⲱⲃⲓ "brick", a word which subsequently entered Spanish and English ("adobe"). According to Behnstedt (1981: 93), the same Coptic word is also the source of the Egyptian Arabic provincialism *ṭōf* "Gemisch aus Häcksel und Nilschlamm zum Ziegel- und Mauerbau".
- *wāḥa* "oasis" < ^{s}ⲟⲩⲁϩⲉ, ^{b}ⲟⲩⲁϩ (Vycichl 1983: 241); via Greek, the Egyptian word was also borrowed into English as "oasis".

Numerous Coptic toponyms are attested in medieval Arabic sources and are often still used in modern Egypt in an Arabified form. The most extensive collection of such names is by Timm (1984-1992). I present a choice in appendix 9. It is not easy to exploit toponyms for phonological inquiries since, in theory, each modern place name belongs to a different variety of Arabic, namely that of the locality in question, for which the phonological system is not always well known. Research on this field would promise valuable insights into both the phonetic developments of specific provincial Arabic vernaculars and into the sound systems of former Egypto-Coptic local dialects.

It appears that certain grammatical peculiarities of modern Egyptian developed under the influence of Coptic, but the issue is disputed (cf. Littmann 1902; Bishai 1960 and 1962; Palva 1969). Bishai (1961) considers the possibility of a phonological influence of Coptic on Egyptian Arabic. He concludes that such an influence seems plausible in two areas:

- According to Bishai, the Cairene dialect has subphonemic aspiration of voiceless stops which is lacking in the dialect of Upper Egypt. He relates this to the presence of aspirate stops in Bohairic (which, however, were phonemic here!) and their absence in Sahidic. There is a rough geographic congruence of Sahidic and Upper Egyptian on the one hand and Bohairic and Cairene on the other.
- Consonants, including /k/, have palatalized allophones before front vowels in the Upper Egyptian vernacular, which seems to be unattested elsewhere in Arabic. Bishai relates this to the presence of a palatal stop /kj/ in Coptic (but note again that this is a phoneme here).

We can conclude that Coptic influence on Arabic is in the whole rather limited.

Severus Ibn al-Muqaffa, a Christian bishop of the 10th century AD, wrote a book in the Arabic language *Tārīx baṭārikat al-kanīsah al-qibṭiyyah bi-l-ʔIskandariyyah* (*History of the patriarchs of the Coptic church in Alexandria*) which contains quite a number of specific Coptic terms and names in Arabic transcription. Furthermore, the syntax of the Arabic text shows some influence from Coptic. The Copticisms in this text are discussed by Farag (1976).

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Galtier (1906: 91-99) published a portion of a manuscript that renders a religious text in the Coptic language but in Arabic script. This manuscript may date to the 18th century (cf. KhS-Burmester 1965/66: 52). Sobhy (1940) published a small part of a manuscript from 1722AD in which a Coptic text is found alongside with an Arabic transcription.

2.9.5 Greek

Greek sources, probably beginning already with the Linear B inscriptions of the 2nd millennium BC (see Hemmerdinger 1968: 238f.), provide an immense number of Egyptian names and words in transcription, sometimes even with explicit translation. As far as the classical literary texts are concerned, all dating is difficult since they underwent repeated reediting and copying until the manuscripts that we have today were written. Comparatively late in the process of copying, texts of classical authors were supplied with diacritics which, among others, serve to note word accent as well as the phoneme /h/. In as far as these diacritics were attached to Egyptian names, they seem to have been added by certain mechanical principles and therefore give no clue to the original pronunciation. Many Egyptian names are not marked by diacritics at all in the available manuscripts; it has nevertheless become tradition for editors in the fields of papyrology and classical philology to add accentuation marks based on their own opinion. These diacritics have no scientific value whatsoever (see Clarysse 1997 on the issue).

There is no comprehensive collection of Egyptian words in Greek transcription. The below-mentioned sources permit to retrieve only a part of what actually exists. Quaegebeur (1991a) gives a general overview of Greek transcriptions of Egyptian. For Egyptian proper names in Greek transcription see Brunsch (1978 and 1985), Clarysse & van der Veken (1983), Lüddeckens & Thissen (1980ff.), and Quaegebeur (1974). Egyptian toponyms in Greek transcription can be found in Timm (1984-1992) and Roquet (1973c: 35-38). Several types of Egyptian words in Greek transcription are cited by Vycichl (1983: 483-487). Egyptian loans in Greek are discussed by Ernštedt (1953), Fournet (1989), Griffith (1994), Hemmerdinger (1968), McGready (1968), and Pierce (1971). Some of these words were further borrowed into modern European languages including English; some examples which I consider certain are:

- *br* "cargo boat" > βᾶρις > *bark* (*ship*) (Fournet 1989: 57)
- *hbnï* "ebony" > ἔβενος > *ebony* (Fournet 1989: 59)
- *qmy.t* "resin" > κόμμι > *gum* (Fournet 1989: 62)
- *hbï* "ibis" > ἶβις > *ibis* (Fournet 1989: 60)
- *md.t* "speech, affair" (> ^{S}ⲙⲟⲩⲧⲉ) > μῦθος > *myth* (Ernštedt 1953: 55-57)
- *nṯrj* "natron" > νίτρον > Arabic نطرون *naṭrūn-* > *natron* (Fournet 1989: 64)
- *wḥꜣ.t* "oasis" (> ^{S}ⲟⲩⲁϩⲉ) > ὄασις > *oasis* (Fournet 1989: 67)

(Egyptian *h* / *ḥ* was generally lost in words passing through Greek, see Sethe 1925: 51f.).

Greek texts written in Egypt may contain loan translations from Egyptian (for an example see Husson 1982).

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2.9.6 Other African languages and scripts

- It is plausible to assume that many Egyptian words entered the African languages further south. The first indigenous language known from here is Meroïtic, attested from the 2nd century BC until approximately the 5th century AD. Meroïtic is written in a syllabic script which is attested in two varieties, the sign forms of which were adopted from respectively the hieroglyphic and the Demotic scripts of Egypt. The Meroïtic script indicates vowels and word boundaries. Francis Ll. Griffith ingeniously deciphered this script at the beginning of the 20th century (Griffith 1911).[53] The language itself is still hardly understood. However, Egyptian etymologies have been suggested for about twenty Meroïtic words; furthermore some Egyptian divine names are attested in Meroïtic transcription. For this see Meeks (1973: 19f.), Hintze (1973b), and Hofmann (1990). It is curious to note that these borrowings, despite their comparatively late date of attestation, show archaic phonetic features known elsewhere only from the cuneiform transcriptions of the 2nd millennium BC (☞ § 5.5.4). So we can stipulate that these words had already spread south during the New Kingdom – a time when the area was politically dependent on the Egyptian empire – and then failed to undergo sound changes which subsequently took place in Egypt.
- Many Egyptian or Coptic words (and, by intermediation of Coptic, also Greek words) are found in medieval Old Nubian and in modern Nubian languages. Much material has been collected by Khalil (1988: 76-110, 1990, and 1996). Cf. also Roquet (1972 and 1973d) and Vycichl (1993: 334-336). Some of these words entered Nubian from Coptic, but others show the same phonetic archaisms as also found in Egyptian words in Meroïtic, indicating that these borrowings must be remarkably ancient.
- Egyptian words in other African languages have barely been identified. Since regular sound correspondences between Egyptian and possibly genetically related languages within Africa have not yet been established, a differentiation of loan words and Afroasiatic cognates is only possible for cultural words for which borrowing can be assumed for extralinguistic reasons. To this group belongs the Beja[54] word *hatāy* for "horse" which is likely to be a loan from Egyptian *ḥtr* > ^{S}ϩⲧⲟ "horse" (Vycichl 1960b: 260f.; the horse was imported into Africa from the north). Furthermore, the camel along with its name entered Africa from Asia. Its Semitic name **gamal-* (Hebrew גָּמָל) – whence also the English term – was borrowed into Egyptian approximately in the early 1st millennium BC rendering Coptic ^{S}ϭⲁⲙⲟⲩⲗ /kʲa'mul/ (for the sound shift /'ma/ > /'mu/ ☞ § 5.5.7). The word subsequently entered languages like Old Nubian: ⲕⲁⲙ (Browne 1996: 84), Nobiin (modern Nile

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[53] For the modern state of affairs with regards to the Meroïtic script see Hintze (1987).

[54] A little known language spoken in North-East Sudan which some scholars classify among the Cushitic languages.

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Nubian): *kám* (Vycichl 1956a: 44, the tone of this form from Werner 1987: 360), Midob (modern Darfur Nubian): *kə́əl* (form from Werner 1993: 104), and Beja: *ka:m* (Vycichl 1956a: 44), all "camel". In other African languages, we have terms which seem to have been formed from the Coptic by metathesis: Hausa *rà:k'úmí:*, Kabyle (Berber) *alγʷəm* (< **a-lγum*) (Vycichl 1990: 18f.).

2.9.7 Other European and Asian languages and scripts

- Cramer (1961) published a manuscript of a liturgical text in the Coptic language with a secondarily added Latin transcription. She fixes the addition of the transcription to a time between 1531 and 1718AD (Cramer 1961: 79).
- Roquet (1973a: 19-25) discusses two possible borrowings from Coptic into Old French: *gainele* et var. "kind of ship" < ^{s}ϭⲓⲛⲟⲩⲏⲗ and *melout* "sheepskin" < ^{s}ⲙⲉⲗⲗⲱⲧ.
- One or two Egyptian names are rendered in Carian script (Kammerzell 1993: 7 and 95f.).
- One of the most important known documents of the Hurritic language (2nd millennium BC) is a letter written in cuneiform characters which was sent to the Egyptian pharaoh Amenophis III. This text, which was retrieved in the Tell el-Amarna archive in Middle Egypt, contains transcriptions of the pharaoh's name which are somewhat different from the transcriptions of the same name in cuneiform documents written in the Akkadian language. The name forms are supplemented with Hurritic case suffixes (cf. Vycichl 1990: 99).

2.10 Borrowings into Egyptian and rendering foreign speech in Egyptian scripts

2.10.1 Semitic languages

Throughout its attested history, Egyptian absorbed words from Semitic languages. It appears that borrowings from Semitic were not always fully adapted to the native phonological system, but occasionally brought about an expansion of the phonological inventory of Egyptian (☞ §§ 3.7.3, 3.7.7, and 5.6.4.3).

Late Egyptian had a particularly high proportion of borrowings from Semitic (especially North-West Semitic), which have been collected by Hoch (1994). Some of these words survived in Coptic, which allows for important conclusions on the phonetic development of Egyptian during the meantime. A list of such words is given in appendix 5. Further Semitic words entered Egyptian during the 1st millennium BC and in the Coptic period. Semitic loan words in Demotic are discussed by Vittmann (1996). On Semitic loans in Coptic see Stricker (1937), Vycichl (1983: 502-510), and Westendorf (1965/77: 669-677).

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In some late non-literary Coptic texts we find words from Arabic, the language to which Coptic finally gave way. Examples are ⲕⲟⲗⲗⲁⲑ "pot" (< قلّة *qulla*^{t})[55], ⲁⲗϩⲁⲧⲁ "border" (< الخط *al-xaṭṭ*)[56], ⲁⲧⲧⲁⲗⲁⲕ "divorce" (< الطلاق *aṭ-ṭalāq*)[57], ⲁⲗⲗⲏⲥⲕⲉ "sticking plaster" (< اللصقة *al-liṣqa*^{t})[58]. Nouns are frequently borrowed together with the Arabic definite article. Altogether, Arabic words are rare in Coptic. Proper names of Arabic origin are somewhat more frequent (see Heuser 1929: 111-117; examples: ⲁⲗⲓ < *ʿAlī*, ⲁⲃⲇⲉⲗⲗⲁ < *ʿAbd-Allāh*, ⲁⲃⲓⲃⲟ < *Ḥabīb*[*u*]). On possible cases of influence of Arabic phraseology in Coptic texts see Störk (1989: 185).

Several Hebrew proper names were in use in Coptic Egypt. However, these names were not borrowed directly from Hebrew but via the Greek Bible translation (e.g. ⲁⲇⲁⲙ, ⲉⲓⲱⲁⲕⲓⲙ, ⲙⲓⲭⲁⲏⲗ; see Heuser 1929: 105-111).

For a word possibly borrowed from Old South Arabic into Ptolemaic Egyptian see Betrò (1993).

Transcriptions identifiable as Semitic proper names are already attested from the Middle Kingdom in so-called execration texts published by Sethe (1926) and Posener (1940), as well as in a papyrus discussed by Schneider (1987).

Several hundred presumably Semitic proper names found in New Kingdom texts have been assembled by Schneider (1992). Semitic toponyms in Egyptian sources have been collected by Aḥituv (1984).

Aside from borrowings and transcriptions of single words, the Egyptian script was also used to write whole phrases or texts in Semitic languages during the New Kingdom. A hieratic ostracon of this kind has been published by Shisha-Halevy (1978). One sentence within the Late Egyptian literary opus of Papyrus Anastasi I likewise appears to be written in a Semitic language (Fischer-Elfert 1986: 198f.; Hoch 1994: no. 6), as is also the case for the much longer final passus of the Magical Papyrus Harris (Schneider 1989).

The London Medical Papyrus (pBM 10059) contains several short and sometimes broken passages which seem to be written in one or more foreign languages, probably at least partly belonging to the Semitic branch (see Steiner 1992).

The Old Testament employs letters of the Hebrew alphabet as numerical signs. However, in secular Hebrew texts numbers were commonly written with the numerical signs of Egyptian Hieratic (Aharoni 1966, Kaufman 1967). Yeivin (1969) published an ostracon found in Israel which contains not only Egyptian numerals but some additional hieratic logograms, along with words written in Hebrew letters. It seems probable that the whole text was to be read in Hebrew.

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[55] In a medical papyrus from approximately the 10th century (Chassinat 1921: 44).

[56] In a letter from the 11th century (Green 1983: 77f.).

[57] In a letter from the 12th century (Worrell & Husselman 1942: 207).

[58] Littmann (1952: 172).

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Papyrus Amherst 63 is a very sizable collection of Aramaic literary texts in Demotic script. This papyrus has been published by several scholars in numerous publications since the early 1980's.[59]

Adherents of the Mormon faith believe that their holy book, the *Book of Mormon*, was originally composed in Hebrew written in a variety of the Egyptian script ("reformed Egyptian")[60]. However, the text is only preserved in a (presumed) English translation thereof.

There is a manuscript of more than forty leaves, dating approximately to the 13th century AD (Satzinger 1972: 42), which contains an Arabic version of the *Apophthegmata Patrum* in Coptic characters. It was published by Casanova (1901), Sobhy (1926), and KhS-Burmester (1965/66). The phonetic correspondences of this text are discussed by Satzinger (1972 and 1991a: 60-62). Blau (1979) provides a detailed examination of the text from an Arabistic vantage point. The text basically represents an early form of the Egyptian Arabic vernacular.

Another short Arabic text written in Coptic letters was published by Crum (1902).

2.10.2 Greek

From the time of the New Kingdom, we have a list of Cretan toponyms in Egyptian transcription (Edel 1966 and 1988). We do not know whether these are Pre-Greek names or forms already adapted to the phonological system of (Mykenean) Greek.

Many Greek words and names are transcribed in Demotic. On renderings of Greek personal names in Demotic see Clarysse & van der Veken (1983). But also about one hundred Greek loan words have been identified in Demotic texts (Clarysse 1987). They are of course usually transcribed in Demotic script. However, texts have been found in which Greek words are written in the original script (from left to right) within the Demotic text which goes from right to left (Bresciani & Pernigotti & Betrò 1983: 70). Finally, some Greek texts written in Egypt contain Demotic logograms which are obviously to be pronounced in Greek (Pestman 1980: 76-78).

Greek words were borrowed to a much higher extent into Coptic. For Greek loans in Coptic see Blok (1927), Böhlig (1954 and 1955), Girgis (1963-1991), and Wessely (1910) (also ☞ § 2.8.2). Greek loans in Coptic are not fully adapted to the native phonological system but show several peculiarities (☞ §§ 3.3.5, 3.18, 5.8.1). Greek influence was so

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[59] Cf. e.g. Steiner & Nims (1985), Steiner (1991), Vleeming & Wesselius (1985), Zevit (1990), Kottsieper (1997).

[60] This expression is based on Mormon 9:32f.: "And now, behold, we have written this record according to our knowledge, in the characters which are called among us the reformed Egyptian, being handed down and altered by us, according to our manner of speech. And if our plates had been sufficiently large we should have written in Hebrew (...)".

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intense that Coptic texts may contain portions in which all lexical roots are of Greek origin (Kasser 1991g: 217 gives an example), or may integrate whole Greek phrases including Greek inflections, e.g. *Triadon* 291f. (= von Lemm 1903: 18).

It would seem plausible that Greek also had some structural influence on Coptic. Nagel (1971: 344-348) discusses some expressions which he considers loan translations from the Greek. For a possible case of syntactic influence of Greek on Coptic see Polotsky (1987/90: I, 158). The fact has to be taken into account that most extant Coptic texts are translations from Greek anyway.

Greek proper names were very common in Coptic Egypt (see Heuser 1929: 76-98). Additionally, there are numerous examples of indigenous proper names which were used in a graecisized form (Heuser 1929: 43-46). This can mean suffigation of Greek morphemes to Coptic roots (e.g. ⲡⲁⲡⲛⲟⲩⲑⲓⲟⲥ from the Coptic name ⲡⲁⲡⲛⲟⲩⲧⲉ) or substitution of specifically Coptic phonemes by sounds from Greek (e.g. ⲡⲓⲕⲱⲥ /piˈkos/ as a graecisized by-form of the Coptic name ⲡⲉϭⲱϣ /pəˈkʲoʃ/). There were also individuals in Late Egypt who had two equivalent names, one of which was Egyptian, the other Greek (Quaegebeur 1992).

It appears that a similar graecization could also take place in toponyms. The modern Arabic form of some originally Coptic place names can only be explained from a graecisized pronunciation (☞ appendix 9).

2.10.3 Other African languages

We find African proper names in so-called "execration texts" already in the Old[61] and Middle[62] Kingdoms. However, it is impossible to relate them to any known language. From later times, many more African proper names are known in Egyptian texts, e.g. the names of numerous Nubian kings (von Beckerath 1984: 269-272, 307-314). For African toponyms found in Egyptian sources see Zibelius (1972). A Demotic text contains an inintellegible phrase which is described as being written in the language of Nubia (Thissen 1991: 375).

From the New Kingdom on, certain African words or names in Egyptian texts can be specifically identified as Nubian (Hofmann & Tomandl & Zach 1989: 275, Khalil 1988: 73f., Priese 1968 and 1974: 31) or Meroïtic (Hofmann 1981). Behrens (1984/85: 160-163) discusses three presumable Pre-Berber loans in Middle and Late Egyptian. For another possible Egyptian borrowing from an African language see Hintze (1989).

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[61] Abubakr & Osing (1973), Osing (1976), Wimmer (1993).

[62] Sethe (1926), Posener (1940 and 1987).

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2.10.4 Other European, Asian, and unidentified languages

- The names of numerous Roman emperors have been preserved in Egyptian transcription, see von Beckerath (1984: 296-306). Some Latin words and proper names appear in Coptic, but it is probable that most or all of them were borrowed via Greek. On Coptic words of Latin origin see Horn (1984), some examples are: ⲕⲁⲛⲇⲏⲗⲁ "candle" < *candela*, ⲡⲣⲉⲧⲁ "booty" < *praeda*, ⲥⲧⲁⲩⲗⲟⲛ "stable" < *stabulum*. For proper names of Latin origin see Heuser (1929: 98-105), examples are: ⲁⲅⲣⲓⲕⲟⲗⲁⲟⲥ < *Agricola*, ⲕⲗⲁⲩⲧⲓⲟⲥ <*Claudius*, ⲡⲟⲩⲡⲗⲓⲟⲥ < *Publius*.
- There is a glossary from the 13th century AD rendering numerous Old French words and phrases in Coptic characters, accompanied by Arabic translations (I cite a few examples in § 3.3.8.2). This document has last been discussed by Roquet (1973a). It also contains about twenty words (with translation) of an unidentified language.
- Not many borrowings from the Anatolic branch of Indo-European (e.g. Hittite) into Egyptian have been identified to date. Schneider (1996: 175f.) proposes an Anatolic origin of four Late Egyptian words, e.g. *pdr* "basket (or similarly)", twice attested in the NK, < Hittite *pattar* / Lycian πατάρα "basket". A number of Hittite and other Anatolic proper and place names written in Egyptian hieroglyphs are known (cf. e.g. Edel 1973, 1983, 1997; Haider 1984).
- The Persian Achaemenid kings ruled over Egypt from 525 to 405 and from 342 to 332 BC. From this time, several Persian names and titles have been preserved in the hieroglyphic and Demotic scripts, of which there is no comprehensive collection yet. Some of these materials can be accessed by Devauchelle (1988), Edel & Mayrhofer (1971), Huyse (1992), Mayrhofer (1972 and 1979: III, 25), Posener (1936), Schmitt (1985), Smith (1992), and Vittmann (1991/92). On an Iranian name transcribed in Coptic in the 7th century AD see Huyse (1990).

  Some Coptic words are assumed to be borrowings from Iranian (Westendorf 1965/77: 679, Vycichl 1983: 514). On Coptic proper names of possibly Persian origin see Heuser (1929: 118).
- We know approximately a dozen Carian proper names in Egyptian transcription from the mid 1st millennium BC (Kammerzell 1993: 9-14, 218-229). These transcriptions played a major role in deciphering the phonetic values of the Carian characters.
- The Hurrians were an important people of the Near East especially during the 2nd millennium BC. The name of this ethnic group (on this name cf. Wilhelm 1982: 2f.) became the general Late Egyptian term *ḫr* for "Asian" and subsequently developed into a Coptic appellative noun ^{S}ϩⲁⲗ "servant, slave". Their language, which is of disputed genetic affiliation, is the source of a considerable number of loan words in the ancient Semitic languages. Hurrian words have also been identified in Egyptian, for which both direct borrowing and intermediation by Semitic languages is possible; see Ward (1989) and Hoch (1994: 555). For Hurrian place names in Egyptian transcription see Astour (1981: 21-26).

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- The hieratic medical papyrus London (pBM 10059) from the New Kingdom contains two short magical spells which are completely inintelligible. The first of them is described in the bytext as written in the language of the people of Crete. This is possibly to be identified with the still undeciphered language of the linear-A tablets.[63]
- Quibell (1907-1913: vol. 3, p. 109 and plate 42,3) published an ostracon which bears an inscription written in Coptic letters but an unknown language. The editor believed it was written in an African tongue, but there is actually no evidence as to the language of this text.

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[63] On the text see Vercoutter (1956: 82-85) and Goedicke (1984: 101-103).

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3 Consonants

3.1 Egyptian stops: preliminary remarks

In most Afroasiatic languages stops have three manners of articulation, namely voiceless, voiced, and emphatic. This is true for Semitic (emphatic stops are lacking in modern Hebrew and some peripheral dialects of Modern Arabic), Berber, Chadic, and Cushitic (some Cushitic languages do not have emphatic stops).

In Earlier Egyptian, stops had four places of articulation and likewise appear to have had three manners of articulation, which is most evident for the dental stops. While it is possible to assign the Egyptian stops to three classes representing manners of articulation, let us postpone the question of what these manners of articulation actually were until § 3.2.

We can arrange the stops of Earlier Egyptian as follows:

	labial	dental	palatal	velar
(1)	‹p›	‹t›	‹ṯ›	‹k›
(2)	?	‹d›	‹ḏ›	‹q›, ‹g›
(3)	‹b›	‹ʿ›	‹j›?	?

The assignment of single phonemes to one of the articulation classes rests on several pieces of evidence. Note particularly:

- The members of row (1) are written as aspirates, the members of row (2) as non-aspirated stops in Bohairic Coptic.
- The fact that ‹k› was palatalized to ‹ṯ› (☞ §§ 3.9.1 and 3.9.2) – and not, for example, to ‹ḏ› – confirms the assumption that ‹k› and ‹ṯ› share the same manner of articulation.
- The fronting ‹ṯ› > ‹t› and ‹ḏ› > ‹d› (☞ § 3.9.7) confirms that ‹ṯ› and ‹t› share one manner of articulation, as do ‹ḏ› and ‹d›.
- All members of row (3) appear as spirants in the later stages of the language, but at least for ‹b› and ‹ʿ› there is evidence that they were originally stops. The assignment of ‹j› to this class is hypothetical and will not be discussed further in this book.[64]

It is disputed at which time stops of class 3 developed into spirants. I argue that both ‹b› and ‹ʿ› (=/d/) probably remained stops until the Middle Kingdom. Occasionally they are preserved as ⲡ and ⲧ respectively even in Coptic (☞ §§ 3.12.4 and 3.6.2).

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[64] For a possible etymological connection of ‹j› to Afroasiatic /g/ see SCHENKEL (1990: 51) and SCHNEIDER (1997: 193).

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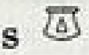
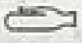
3.2 The opposition between two series of stops in Egyptian: various hypotheses

After the stops of class 3 had undergone spirantization, there were only two manners of stop articulation left in Egyptian (classes 1 and 2). These two classes of stops persisted as stops throughout all of the history of the language. Let us now consider the nature of the phonemic opposition between both classes.

The first Egyptologists tended to understand the distinction of both classes as a mere allographic variation (cf. Schenkel 1990: 29f.). However the consistent differentiation in Egyptian writing soon made scholars believe that there must actually have been a phonetic distinction between these stops. Consequently, they invented various diacritics to distinguish them in their transcriptions. The nature of the opposition, however, remained obscure.

3.2.1 Opposition voiceless – voiced

When Brugsch & Erman (1889) established a convention of transcribing Egyptian, they decided to render class 1 stops with the letters for tenues, class 2 stops with the letters for mediæ of the Latin alphabet. It was clearly expressed then that this practice served nothing but typographical convenience and did not anticipate a decision on the phonetic interpretation of these signs, e.g.:

> "Gegen eine Wiedergabe des  durch *g* und des  durch *d* kann man einwenden, daß diese Laute dabei eigentlich genauer bezeichnet sind, als gut ist; es wäre richtiger, sie durch *k* und *t* mit angefügten diakritischen Zeichen auszudrücken. Aber da wir ohnehin schon zwei *k* und zwei *t* in unserem System haben, so wird es gut sein, doch bei *g* und *d* zu bleiben (...)" (Erman 1896: 53).

This transcription system, being propagated by the influential Berlin school, soon became firmly established. Subsequently, a number of scholars began to believe in the voiced character of the stops of class 2,[65] and the suspicion can hardly be avoided that the mere transcription convention encouraged them to do so. Based on this assumption, dozens of Egyptian–Afroasiatic etymologies were proposed[66] which seemed to corroborate the voice hypothesis. Today this hypothesis is prevalent primarily in non-specialized literature on Egyptian from other fields than Egyptology.

Hoch (1994: 425-427) examines the representation of Semitic borrowings in Late Egyptian. He concludes that the opposition between the two classes of Egyptian stops

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[65] E.g. Sethe (1912: 96f.), Gardiner (1957: § 19). Albright (1934b: 222) even assumes that ‹d› was voiced and ‹t› was half-voiced.

[66] E.g. Ember (1930), Calice (1936), Vergote (1945: 127-148), Cohen (1947), Vycichl (1958), Orel & Stolbova (1994), Ehret (1995).

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was indeed basically one of voice. However this is not at all evident from his data. Hoch (1994: 427) states:

> "First, the Egyptians usually transcribed Semitic /*d*/ with *d*, but sometimes also with *t*.[67] The same holds true for Egyptian transcriptions of Semitic /*ṭ*/. This suggests that the closest Egyptian approximation to Semitic /*d*/ (almost certainly [d]) was *d*, and the closest approximation of Semitic /*ṭ*/ was also Egyptian *d*. Second, the Egyptian loan or foreign words containing Egyptian /*d*/ are always written with *ṭeth* – and never, to my knowledge, with *daleth* – in the Semitic languages".

Hoch ends up in suggesting that Egyptian ‹d› may also have been voiced and emphatic at once.

If Semitic /d/ is frequently rendered as Egyptian ‹d›, we can indeed conclude that ‹d› is the closest Egyptian approximation of Semitic /d/. However this does not imply that ‹d› was actually voiced (nor does the fact that Semitic /ṭ/ can be rendered as ‹d› suggest that ‹d› was emphatic). ‹d› would likewise be the closest approximation of Semitic /d/ if, say, ‹d› was the only dental stop at all, or if it was a non-aspirate dental stop which contrasted with an aspirate in Egyptian, or if it was a non-rounded stop where the only other dental stop of Egyptian was pronounced with accompanying lip-rounding. It is evident that there must be some Egyptian phoneme which is the closest approximation of Semitic /d/, but this fact alone is not even a weak argument that this phoneme is /d/ (as opposed to, say, a non-aspirate or non-rounded /t/). On the contrary, the inconsistency of the Egyptian transcriptions of Semitic stops suggests that the phonological systems of both languages were quite different from each other.

Many scholars have dismissed the voice hypothesis, and so do I. Cf. also the evidence cited in § 3.3.4. Only this way, it becomes possible to interpret ‹ʿ› as /d/, as is favored in this book (☞ § 3.6.2).

3.2.2 Opposition plain – emphatic

One of several solutions under early consideration was to interpret class 2 stops as emphatic (voiceless) and class 1 stops as plain (voiceless). This idea was first considered by Hincks (1848: 200-202), and Steindorff (1892: 720) favours it decidedly based on transcriptions of foreign words in Egyptian and vice versa. Czermak (1931/34: 57, 64f., 146, 173f., 254-258) adduces evidence in favor of both the voiced and the emphatic character of class 2 stops. He ultimately suggests a voiced articulation for Old Egyptian (based mainly on presumed etymologies), but an emphatic articulation for Middle and Late Egyptian (based mainly on Egyptian-Semitic mutual transcriptions).

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[67] According to Hoch (1994: 431), out of a total of 20 words Semitic *d* is transcribed in Egyptian with ‹d› 15 times, with ‹t› 4 times, and once with ‹r›.

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When the voice hypothesis had become prevalent among Egyptologists, the alternative view was still pronounced by some scholars from neighboring fields. Based on evidence from mutual transcriptions as well as Hausa-Egyptian etymologies, Hodge (1966: 42f.) argues that ‹d› must have represented a glottal or emphatic sound. The Semitist Rössler (1966: 226 and 1971) strongly favors the interpretation of class 2 stops as emphatics. His evidence includes rules of consonantal incompatibilities (Rössler 1971: 275-277) (on which ☞ § 4.11), transcriptions of Semitic words into Egyptian (Rössler 1966: 225), and alternative Egyptian-Semitic etymologies (Rössler 1966: 227f., 1971: 280-320).

It took some time until another Egyptologist opted for the emphatic hypothesis (Schenkel 1987: 28-30), but then others quickly followed suit. It should be stated that Egyptian-Semitic mutual transcriptions from the New Kingdom fit Rössler's theory better than the traditional one, but the correspondences are still far from perfect.[68] More than a hundred alternative Afroasiatic etymologies based on Rössler's system have recently been proposed by Schneider (1997).

As exemplified by the dental series, the two opinions can be summarized as follows:

transcription symbol	‹t›	‹d›	‹ʿ›
traditional interpretation	/t/	/d/	/ʕ/
Rössler's interpretation	/t/	/ṭ/	/d/ (> /ʕ/)

In a more recent attempt, Schenkel tries to combine both approaches in order to take account of Rössler's arguments as well as to leave intact the numerous long-established etymologies conforming to the traditional system (Schenkel 1993). First he accepts Rössler's phonetic interpretation of the Egyptian graphemes. He then posits two Egyptian dialects which differed with respect to stop articulation. According to Schenkel, original /d/ developed into /ʕ/ ‹ʿ› in a northern dialect (i.e., ‹ʿ› represents Proto-Afroasiatic */d/ which conforms to Rössler's view for Egyptian as a whole). On the other hand, a southern dialect experienced the sound shift /d/ > /ṭ/ (written ‹d›). Since Schenkel's /ṭ/ (‹d›) is considered /d/ in the traditional view, this agrees with the earlier etymologies. Schenkel's position implies that the words to be correlated with Afroasiatic by Rössler's sound correspondences are indigenous to Northern Egyptian, whereas words having a traditional Afroasiatic etymology belong to Southern Egyptian.

Thus, we would expect to find many Egyptian words in two contrasting orthographies ideally attributable to written sources of Northern and Southern provenance respectively. This is clearly not the case. Only a small number of words can be noted in alternative orthographies ‹ʿ› ~ ‹d›. At first sight this is a diachronic phenomenon and is understood as such in this book (☞ § 3.6.2). Schenkel adduces these words in favor of his dialect

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[68] For example, /ṭ/ in loans from Semitic is rendered as Egyptian ‹t› and ‹d› in about equal proportion. To the attestations of Semitic /ṭ/ > Egyptian ‹t› registered by Hoch (1994: 433) I wish to add √ʕṭš "sneezing" (e.g. Arabic عطس) > ʿṭš attested once in Dynasty 18 > ^{s}ⲁⲛⲧⲁϣ, ^{b}ⲁⲛⲑⲁϣ (cf. Westendorf 1965/77: 9).

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theory arguing that the center of the standard language shifted from Northern to Southern Egypt with time. ☞ § 2.3 for further discussion.

Kammerzell adopts the emphatic hypothesis and suggests that one of the possible phonetic realizations of “emphasis” may have been retroflexion. He assumes that some emphatics originally developed by contact with *r* in Proto-Egyptian (Kammerzell 1994a: 23f. and 1995: XLIV f., L f.).

Loprieno (1995: 42f.) assumes that an ejective (emphatic) articulation was preserved even in Coptic. Wolfgang Schenkel is currently preparing a paper in order to confirm this claim based on the treatment of Coptic borrowings in Arabic (Schenkel *in preparation*, cf. Schenkel 1997b: 11-14). Since this is still work in progress, I do not discuss his ideas here.

3.2.3 Opposition aspirate – non-aspirate

Vergote (1945: 30f.) draws attention to the fact that class 1 stops are rendered by aspirate signs and class 2 stops by signs for non-aspirate tenues in the Bohairic dialect of Coptic (☞ § 3.3.2). Since Vergote principally accepts the presumed etymologies relating class 1 stops to Proto-Semitic voiceless stops and class 2 stops to Proto-Semitic voiced stops, he assumes a diachronic change which “a converti les anciennes occlusives sourdes [p, t, k] en mi-occlusives aspirées sourdes [*p̊h*, *t̥h*, *k̥h*] et les occlusives sonores [*b* final après l’accent, *d*, *g*] en sourdes douces [*p̊*, *t̥*, *k̥*]”. (Vergote 1945: 31). He suggests that this sound shift might already have happened before the Old Kingdom (Vergote 1945: 33; more decidedly in Vergote 1948: 59f. and 1973/83: Ib, § 17f.; cf. already Sethe 1912: 97), but he keeps the traditional transcription symbols. His view was accepted by Callender (1975: 8f.) and Conti (1976). Vycichl (1990: 44, 54, 57, 64, 218) adopts a related standpoint in assuming that Egyptian basically had an opposition of “occlusive faible” and “occlusive sourde (aspirée)”, already in the early periods. While he adheres to the traditional transcription symbols like *d* vs. *t*, he remarks that *d̥* and t^h would be phonetically more exact transcriptions.

I do not share Hoch’s (1994: 426) criticism of Vergote’s analysis “that a major phonemic opposition based solely on aspiration / non-aspiration remained stable for millennia seems fairly incredible.”

Loprieno (1995: 34) tries to combine all three points of view and suggests that the phonological opposition between classes 1 and 2 was basically one of voice, where the former could be pronounced with subphonemic aspiration, the latter with subphonemic ejective articulation.

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3.2.4 Conclusion

While an opposition between stops of classes 1 and 2 certainly existed, the available data are insufficient to show with certainty on which phonetic feature this opposition was based. I suggest that the evidence of Bohairic writing should be given more weight 1) than etymological connections to Afroasiatic languages, since there is no reason to believe that etymological correspondences between sounds imply they are phonetically identical or even similar, 2) than Egyptian-Semitic mutual transcriptions, since their inconsistency suggests that the phonological systems were quite different rather than identical on both sides.

I can offer a small piece of positive evidence to argue that the aspiration correlation, which is directly attested in Bohairic only, was once present in Egypt as a whole. Consider the development of the Late Egyptian phrase *pꜣ hrw* "the day, today" into Sahidic ⲡⲟⲟⲩ "today" (with univerbation)[69] (Bohairic has ⲫⲟⲟⲩ). Egyptian ‹h› is missing in this Sahidic word for no apparent reason, whereas it is retained in clusters with consonants other than stops, such as *rhbw* "fire" > ^{s}ⲗϩⲱⲃ, *mhw.t* "family" > ^{m}ⲙϩⲉⲩ[70], *nhr* "horror"[71] > ^{b}ⲛϩⲟⲩⲣ). I suggest that the absorption of ‹h› in ⲡⲟⲟⲩ is most easily understandable if ‹p› was an aspirate, undergoing the development /pʰh/ > /pʰ/ > ⲡ.

The same phenomenon is found in the verb ^{s}ⲧⲉⲗⲏⲗ, ^{b}ⲑⲉⲗⲏⲗ "to rejoice". The Bohairic form can only be interpreted as /thəˈlel/ with an initial cluster /th-/. This word seems to be a borrowing from the well-known Semitic root √*hll* "to jubilate, to praise" (Hebrew הִלֵּל "to jubilate", whence English *hallelujah*; Arabic هل *halla* "to jubilate"; cf. Černý 1976: 186); I suggest that it is based on a form such as the Arabic verbal noun تهليل *tahlīl-* "jubilation". The consonant *h* is absent in Sahidic which is again most easily explained as a simplification process /tʰh/ > /tʰ/ > ⲧ.

This phonemic fusion does not affect the combination stop + ‹ḥ› in Sahidic, cf. *ḏḥwty* > ^{s}ⲑⲟⲟⲩⲧ /ˈthɔwt/, ^{b}ⲑⲱⲟⲩⲧ and *ḥw.t-ḥrw* > ^{s}ϩⲁⲑⲱⲣ /hatˈhor/, ^{b}ⲁⲑⲱⲣ (both are originally divine names and have developed into month names in Coptic, ☞ appendix 6).

3.3 Stops in Later Egyptian (including Coptic)

3.3.1 General remarks

Both classes of stops were distinguished strictly until about 1000BC. There is no confusion between written ‹k› and ‹q›/‹g› until the New Kingdom. This also holds true for

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[69] To be compared with ⲡⲉ-ϩⲟⲟⲩ "the day". Similar univerbations affect the groups *tꜣ wnw.t* "this hour" > ^{s}ⲧⲉⲛⲟⲩ "now" and *tꜣ rnp.t* "this year" > ^{s}ⲧⲣⲟⲙⲡⲉ "this year" ("the hour" and "the year" are ^{s}ⲧⲉ-ⲩⲛⲟⲩ and ^{s}ⲧⲉ-ⲣⲟⲙⲡⲉ respectively).

[70] Gabra (1994: 194).

[71] Attested in Nastasen's stela, line 2, cf. Peust (1999).

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the palatals ‹ṯ› – ‹ḏ› and dentals ‹t› – ‹d›.[72] Only as concerns the distinction of ‹p› and ‹b›, cases of confusion can already be observed in the New (or perhaps even Middle) Kingdom (cf. WARD 1975).

After the New Kingdom, confusion between both series of stops becomes very frequent in Egyptian writing. A phonetic merger of some kind is certainly the cause of this phenomenon. The use of stop signs in Egyptian texts from the Late Period has not yet been investigated in detail, and it is not clear whether there are any conditions for graphical alternations.

Classical Greek has three classes of stops: voiceless non-aspirate (π, τ, κ), voiceless aspirate (ϕ, ϑ, χ), and voiced (β, δ, γ). The stops of the two latter classes were in the process of developing into spirants already in antiquity and are generally pronounced as such in Modern Greek. All Coptic dialects make use of all Greek signs for stops, however there is a fundamental difference between Bohairic on the one hand and all remaining dialects on the other. They will therefore be discussed separately in the following sections.

ⲃ indicates a fricative in Coptic and therefore falls out of our consideration here (☞ §§ 3.12.4f. instead). ⲇ and ⲅ are mainly restricted to Greek loan words; their use is discussed in § 3.3.5 (for ⲅ ☞ also 3.3.7).

3.3.2 Stops in Bohairic

In the Bohairic dialect of Coptic, the stops of classes 1 and 2 are still distinguished from one another when directly preceding the stressed vowel. Stops of class 1 are rendered with those Coptic letters which represent aspirates in Greek and stops of class 2 with those Coptic letters which represent non-aspirate voiceless stops in Greek. The distinction is expressed by native signs at the palatal place of articulation since the Greek alphabet provides no means of expressing palatals.

	labial	dental	palatal	velar	Egyptian predecessors
aspirate (= class 1)	ⲫ	ⲑ	ϭ	ⲭ	*p, t, ṯ, k*
non-aspirate (= class 2)	ⲡ	ⲧ	ϫ	ⲕ	(*b*), (ʿ), *d*, *ḏ*, *g*, *q*

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[72] Following KAMMERZELL (1995: LII), contra JUNGE (1996: 36), LOPRIENO (1995: 38), WESTENDORF (1962: § 78 and 1981: 59), and WINAND (1992: 47). The only counterexample seems to be the popular verb ‹ḏd› "to say" which in Late Egyptian develops an allomorph with final $/t^h/$ (= ‹ti› ~ ‹tw›) in the status pronominalis of the infinitive (i.e. when object clitics follow). Instead of explaining this by a general phonological neutralization, I assume a peculiarity of an irregular verb here. In the New Kingdom, ‹ḏd› had probably lost any reflex of ‹d› in pronunciation (☞ § 3.14.4), so in a synchronic view we simply witness the addition of $/t^h/$ for the status pronominalis. This was common for many other verbs and could easily have been inferred by analogy.
The picture is complicated by the fact that in the hieratic handwriting the distinction between the monoconsonantal signs 𓂧 ‹d› and 𓏏 ‹t› is frequently neutralized. This phenomenon is unknown from contemporary hieroglyphic texts.

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Examples of minimal pairs:

- ^{b}ⲑⲱⲣⲓ /'t^{h}ori/ “willow” < *ṯr.t* — ^{b}ⲧⲱⲣⲓ /'tori/ “hand” < *ḏr.t* (Sahidic has ⲧⲱⲣⲉ in both cases).
- ^{b}ϭⲱⲙ /'c^{h}om/ “garden” < *kꜣnw* — ^{b}ϫⲱⲙ /'com/ “roll of papyrus, book” < *ḏmꜥ* (Sahidic has ϭⲱⲙ /'kʲom/ and ϫⲱⲱⲙⲉ /'co:mə/ respectively)
- ^{b}ⲁⲭⲱ /a'k^{h}o/ “magician” < *ḥkꜣw* — ^{b}ⲁⲕⲱ /a'ko/ “destruction” < *ꜣqy.t* (Sahidic has ϩⲁⲕⲟ and ⲁⲕⲱ respectively)

While this rule holds true for by far most cases, there are a few irregular developments, e.g. *gḥs.t* “female gazelle” > ^{b}ϭⲁϩⲥⲓ, *ďšr* “to be read” > ^{b}ⲑⲱⲣϣ, *dḥr.w* “to be bitter” (stative) > ^{b}ⲑⲟϩ. On these cf. Fecht (1960: note 505 on p. 180f.), Osing (1976a: notes 611 and 614 on p. 612-614), and Vergote (1945: 44-46).

The distinction is neutralized if no stressed vowel follows. Both signs then occur in mutually exclusive environments: 1) The aspirate sign is used before sonorants (ⲙ /m/, ⲛ /n/, ⲗ /l/, ⲣ /r/, ⲃ /β/, ⲓ /j/, ⲟⲩ /w/). Thus, the aspirate sign may not only be a representative of an Egyptian stop of class 1, but also of a stop of class 2 in this position (e.g.: *ḏbꜥ* “10 000” > ^{b}ⲑⲃⲁ, ^{s}ⲧⲃⲁ; *qnỉw* “sheaf” > ^{b}ⲭⲛⲁⲩ, ^{s}ⲕⲛⲁⲁⲩ). 2) The non-aspirate sign is used in all other cases.

Hintze (1947b: 204f.) explains that the aspirate writing indicates a partial desonorization of the following sonorant (thus ⲭⲛⲁⲩ would be spoken something like *kn̥naw*). Vycichl (1960a and 1990: 218f.) assumes that the stop was strenghthened since it was felt in the syllable offset (assuming that ⲭⲛⲁⲩ was spoken something like *ək-naw*). I prefer Hintze’s solution.

The rules outlined above may lead to morphological alternations, e.g.:

- *pꜣỉ* (demonstrative pronoun) > ^{b}ⲫⲁⲓ /'p^{h}aj/ in autonomous position but ^{b}ⲡⲁⲓ- /paj-/ (proclitic) in attributive position (Sahidic has ⲡⲁⲓ and ⲡⲉⲓ- respectively)
- *pꜣ* (definite article) > ^{b}ⲫ- before sonorants, but ^{b}ⲡ- elsewhere (Sahidic has ⲡ throughout).

Whereas according to the general rule the stop opposition is only preserved directly preceding a stressed vowel, there are cases in which the distinction is also observed in other environments:

- The constrast of aspirates and non-aspirates is mostly preserved in Greek loan words without regard to word stress.
- In reduplicated verbs, sometimes the expected form appears (*tḫtḫ* “to confuse” > ^{b}ⲑⲟϧⲧⲉϧ /'t^{h}ɔxtəx/), sometimes aspiration is generalized to both syllables by analogy (*ptpt* “to tread down” > ^{b}ⲫⲟⲧⲫⲉⲧ /'p^{h}ɔtp^{h}ət/ instead of *ⲫⲟⲧⲡⲉⲧ), sometimes the non-aspirate stop is generalized (*wꜣḏwꜣḏ* “to be green” > ^{b}ⲟⲩⲟⲧⲟⲩⲉⲧ /'wɔtwət/ instead of *ⲟⲩⲟⲑⲟⲩⲉⲧ).
- The status nominalis of verbs and nouns almost always retains an etymological aspirate (Kasser 1994b: note 24 on p. 291), although the mutation of its stressed vowel to -ⲉ- indicates that it was unstressed.

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In order to explain this type of exception, Kasser (1994b: 293f., 297) suggests that in addition to stressed and unstressed syllables Coptic had syllables with one or several intermediate degrees of stress.

In a few cases, Bohairic aspirate stops do not derive from Egyptian class 1 stops but rather from a succession *stop + h / ḥ*. The synchronic pronunciation is not quite clear:

- *ḥꜣ.t-ḥrw* > ^{b}ⲁⲑⲱⲣ /aˈtʰor/ (/atˈhor/?) (name of the goddess Hathor)
- **t-hll* > ^{b}ⲑⲉⲗⲏⲗ /tʰəˈlel/ (/thəˈlel/?) "to rejoice" (☞ § 3.2.4)
- *ḏi̯.t-hbi̯* "cause to be low" > ^{b}ⲑⲉⲃⲓⲟ /tʰəβˈjɔ/ (/thəβˈjɔ/?) "to humiliate"

This is a good reason to believe that the aspirate signs in Bohairic actually express aspiration just as the same signs do in Greek, instead of being mere graphical approximations to a specifically Coptic articulation feature (e.g. non-emphatic pronunciation) for which the Greek letters would have provided no better way of expressing.

There is no clear indication that the Bohairic aspirate signs could also be used as digraphs, i.e. to render a sequence of two phonemes (/th/ etc.) in addition to rendering aspirate stops (/tʰ/ etc.). Bohairic never employs aspirate signs if a stop and /h/ meet at a morpheme boundary (e.g. ⲧ-ϩⲏ /ˈthe/ "the front" is not written ⲑⲏ as it regularly is in Sahidic). Although difficult to prove, I assume that a digraphic function of the aspirate signs is nonexistent or at least marginal in Bohairic.

Greek aspirates are regularly rendered as such in Bohairic, and we can assume that Bohairic speakers simply identified aspirate stops of Greek loan words with the aspirate stops of their own language.

3.3.3 Stops in Coptic dialects other than Bohairic

In all Coptic dialects apart from Bohairic, stops derived from Egyptian stops of both the classes 1 and 2 are indiscriminately rendered by ⲕ, ϭ, ϫ, ⲧ, and ⲡ, i.e. by the Greek letters for non-aspirate voiceless stops plus two specifically Coptic letters for palatals. (It should be noted that the difference between ϭ and ϫ is one of the place of articulation in most dialects, whereas it is one of aspiration in Bohairic).

The aspirate signs (ⲭ, ⲑ, ⲫ) do occur in the non-Bohairic dialects, but they are exclusively used as digraphs expressing sequences of *p*/*t*/*k* + *h*. These digraphs occur:

1) frequently to render a sequence of a stop and /h/ which meet at a morpheme boundary. This concerns, for example, the combination of the femin. sg. definite article /t/ + a noun beginning with /h/: ⲑⲏ /ˈthe/ "the front" (= ⲧ + ϩⲏ).
2) more rarely to render a sequence stop + /h/ within a morpheme, e.g. ^{s}ⲙⲁⲭ "neck" (besides more common ^{s}ⲙⲁⲕϩ).
3) as a substitution of aspirate plosives in Greek foreign words.

The digraphic nature of the aspirate signs is evident from a morphophonological observation. In Sahidic, the definite article has two allomorphs: a short form ⲡ- (masc. sg.)/ ⲧ- (fem. sg.)/ ⲛ- (plural) is used before nouns beginning with a vowel or a single consonant,

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and a long form ⲡⲉ- / ⲧⲉ- / ⲛⲉ- is used before nouns beginning with a consonant cluster.[73] The long forms are regularly used before aspirate signs, e.g. ⲧⲉ-ⲭⲱⲣⲁ "the country". Furthermore, the Greek noun θάλασσα "sea" was borrowed into Sahidic and Akhmimic as ϩⲁⲗⲁⲥⲥⲁ since /t/- was perceived as the Coptic definite article and underwent deglutination.[74]
We can thus assume that Sahidic did not have aspirate plosives, and that aspirate stops of Greek had to be substituted by a sequence of two phonemes in the process of borrowing.

3.3.4 Lack of voiced stops in Later Egyptian

After the original voiced stops had developed into spirants (☞ §§ 3.12.4 and 3.6.2), voiced stops were absent in the Egyptian language. This is confirmed by various pieces of evidence, e.g.:

- Semitic /d/ was occasionally transcribed as ‹r› in Egyptian already in the Middle Kingdom (see Rössler 1966: 221-223 and Quack 1992a: 76f.). This is also true, for instance, for the Late Egyptian borrowing *ʿršn* "lentils" from Semitic √ʕdš (☞ appendix 5).
- In cuneiform transcriptions of Egyptian, ‹t› and ‹d› are usually rendered as /t/ and /ṭ/ respectively, but both occasionally occur as /d/, see Bongenaar & Haring (1994: 66). This seems to indicate that voicing was not a distinctive feature of any of these Egyptian stops but may have freely occurred as an allophonic realization.
- The Aramaic transcriptions of the mid 1st millennium BC usually transcribe Egyptian ‹t› by ‹t› and Egyptian ‹d› by ‹ṭ› and sometimes vice versa. The Aramaic letter ‹d› is hardly ever used for representing any Egyptian consonant.[75]
- The name of the Achæmenid king Darius can be written with initial ‹nt› (besides more frequent ‹t›).[76] ‹nt› is a plausible substitution for *d* of the source language (cf. ντ = /d/ in Modern Greek).
- In Greek borrowings in Coptic, voiced and voiceless stops are not distinguished consistently; ☞ § 3.3.5.
- The Demotic word *mḏꜣ* > ⲙⲁⲁϫⲉ (only in Sahidic) (a measure) was borrowed into Greek as μάτιον (Fournet 1989: 70).

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[73] Before ⲧⲣ- both allomorphs are attested, cf. Depuydt (1993: note 60 on p. 363).

[74] Girgis (1971-1973: 49f.). With definite article ⲑⲁⲗⲁⲥⲥⲁ in the singular, ⲛϩⲁⲗⲁⲥⲥⲁ in the plural. In Bohairic this word is rare. The only attestation I know of (see Böhlig 1954: 382) has ⲑⲁⲗⲁⲥⲥⲁ (indefinite) and shows no deglutination of *t*-.

[75] Perhaps once in the proper name *šdnhyb*, if this is a transcription of Egyptian *šd-nꜣ-hbw* (Zauzich 1985: 116).

[76] All known Egyptian writings of this name were collected by Cruz-Uribe (1992/93).

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3.3.5 The representation of Greek voiced stops (as well as ζ) in Coptic

Ancient Greek has a set of voiced plosives:[77] β, δ, γ, and a voiced sibilant (or affricate?) ζ, which are alien to Coptic. I leave β out of the discussion here since Coptic does employ the letter ⲃ in native words although for a fricative rather than for a stop. Greek β is normally rendered in Coptic as ⲃ which leaves open several possibilities of interpretation.[78] Coptic texts show four different strategies of dealing with voiced stops in Greek borrowings:

1) In certain biblical manuscripts and other high quality texts, Greek stops are quite consistently rendered as they are in the source language. It is possible that at least certain speakers of Coptic or bilingual individuals maintained the Greek phonemic difference in foreign words.
2) Greek voiced stops may be consistently rendered with the letters for voiceless stops which suggests that they were adapted to the native phonological system. An example is a text published by Saint-Paul Girard (1927) which replaces δ, γ, and ζ in Greek words by ⲧ, ⲕ, and ⲥ.[79]
3) Texts are much more common in which the letters for voiced stops ⲅ, ⲇ, ⲍ are widely used in Greek words, albeit without regard to whether Greek has a voiced or a voiceless stop in the respective position.[80] This indicates that the scribes did not actually distinguish voiced and voiceless stops in pronunciation, but they employed specifically Greek letters for words which they knew were of Greek origin. We can say that there is a specific graphical subset for the Greek component of the lexicon (☞ § 2.5.10). Letters for voiceless and for voiced stops are commonly found in free variation. I know of no Coptic text in which letters for voiceless stops are completely avoided in Greek words.
4) Primarily in certain early manuscripts, we find that stops of Greek words are preceded by a nasal. Thus ⲛⲧ or ⲛⲇ may be written for Greek δ (and even for τ), or ⲛⲅ ~ ⲛⲕ for Greek γ (and κ).[81] This seems to indicate an attempt to pronounce the voiced stops as such, with cases of hypercorrection.

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[77] β, δ and γ have developed into spirants by Modern Greek. The behavior of Greek borrowings into Coptic does not provide clear evidence that this sound shift had already taken place.

[78] 1) Greek β was a stop /b/ but was substituted by a fricative /β/ in Coptic – 2) Greek β was already pronounced as a fricative /β/ as in Modern Greek – 3) Greek β was a stop and was retained as such in borrowings into Coptic, native /β/ and borrowed /b/ not being distinguished in writing.

[79] However, the name Δαυιδ is written ⲧⲁⲩ̈ⲓⲇ.

[80] Cf. Böhlig (1954: 106-111), Girgis (1967-68: 57, 65f.), Kahle (1954: I, 93-96, 127-131).

[81] Girgis (1967-68: 70-76), Kahle (1954: I, 102-104).

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3.3.6 Substitution of foreign /ϑ/ by a stop

The original aspirate stops of Greek were in the process of developing into fricatives already in antiquity. This is also reflected in Coptic where ϕ and χ are occasionally rendered by specific Coptic letters for labial and velar fricatives respectively, e.g. σχῆμα "form" > ⲥϩⲏⲙⲁ and ⲥϣⲏⲙⲁ (besides ⲥⲭⲏⲙⲁ) (Girgis 1967-1968: 62). The time of borrowing from the Greek is likely to be a crucial factor.

We should assume that the dental aspirate ϑ, which in later Greek had likewise become a spirant /ϑ/, was also, at least occasionally, heard as a spirant by the Copts.

If we examine how speakers of languages that lack /ϑ/ realize this sound in foreign words (assumed that they do not pronounce it "correctly"), we find three possible substitutions:[82]

- /t/: most speakers of Dutch, French (in Canada), Slavonic languages, and certain varieties of Chinese substitute English /ϑ/ by /t/. Similarly, speakers of Hindi replace it by $/t^h/$. There are also dialectal varieties of English in which /ϑ/ is substituted by /t/ (e.g. New York city, Ireland).
- /s/: most speakers of German, French (in France), Taiwan Chinese, and, last but not least, modern Egyptian Arabic use /s/ for substituting English /ϑ/. Classical Arabic /ϑ/ and /ð/ regularly developed into respectively /t/ and /d/ in Egyptian Arabic; however the same phonemes /ϑ/ and /ð/ are substituted by /s/ and /z/ in recent learned borrowings from Classical Arabic in dialectal speech.
- /f/: Greek ϑ is regularly rendered as *f* in Old Church Slavonic. English /ϑ/ is frequently substituted by /f/ in Afrikaans, Hongkong Chinese, and in certain English dialects (e.g. Cockney, South Louisiana).

We can observe that Greek /ϑ/ is consistently rendered as ⲑ $/t^h/$~/th/ (more rarely as ⲧϩ, ⲧ, or ⲇ) even in the latest Coptic documents, and never as ⲥ /s/ or ϥ /f/. This indicates that Coptic belongs to the group of languages which substitute foreign /ϑ/ by a dental stop. Within an adequate theoretical framework, this observation would possibly allow for subtle conclusions about the internal structure of the Coptic phonological system.

Note also that the Iranian sound conventionally transcribed *ϑ* is rendered as ‹t› in Demotic transcriptions of Iranian names and titles: **miϑradāta* is transcribed as *mtrtt*, **miϑraxa* as *mjtrḫꜣ* (the element *miϑra-* in both names is the divine name known in Europe as 'Mithras'), **xšaϑrapāvan* as *ḫštrpn* (this is the Persian title known in Europe as 'satrap'), and **vis(a)puϑra* as *wjspwtr* (all these words from Vittmann 1991/92).

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[82] There has been little research on this question, but cf. Smith (1997). I have received valuable data on the topic from several linguists. My thanks go especially to Karen Steffen Chung (Taipei), Joseph F Foster (Cincinnati), Roger Lass (Cape Town), Waruno Mahdi (Berlin), Laura Catharine Smith (Madison), Allison Mary Teasdale (Calgary), and Alain Theriault (Montreal).

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3.3.7 Final [-ŋ] in Sahidic

The sequence ⲛⲕ may be replaced by ⲛⲅ in native Sahidic words (in Greek words, any ⲕ may interchange with ⲅ, ☞ § 3.3.5). This seems to happen only at the end of a word (or syllable?). The phenomenon is unknown in Bohairic.

It appears that the rendering ⲛⲅ expresses an allophonic variety of /nk/. It has been suggested that this is [ng]/[ŋg] (Vergote 1973/83: Ia, § 20; Ernštedt 1986: 109; Loprieno 1995: 41; Kasser 1997: 7), [ŋk] (Hintze 1980: 27; similarly Worrell 1934: 79f., 85), or [ŋ] (Cartreau 1988). We must take into account that no similar assimilatory phenomenon is attested at the other places of articulation (ⲛⲧ does not interchange with *ⲛⲇ), so the solution [ng]/[ŋg] is unlikely (if /n/ causes a following velar stop to become voiced, why not a following dental stop?). If ⲛⲅ rendered [ŋk], the restriction to velars would be understandable but a complicated graphonemic relation would have to be assumed. [ŋ] certainly is the most straightforward solution which I favor here.

- ^{s}ⲁⲛⲅ /ank/ [aŋ] (rhematic independent personal pronoun 1st pers. sg.) < *ink*
- ^{s}ⲙⲟⲩⲛⲅ /ˈmunk/ [ˈmuŋ] (^{s}ⲙⲟⲩⲛⲕ also attested) "to form" < Demotic *mnq*
- ^{s}ⲧⲱⲟⲩⲛ-ⲅ /ˈtownk/ [ˈtowŋ] "rise yourself" < *dwn-k*
- ^{s}ⲛ-ⲅ /n̩k-/ [ŋ-] (prefix 2nd pers. sg. masc. conjunctive) < *mtw-k*

but: ^{s}ⲛⲕⲟⲧⲕ /n̩ˈkɔtk/ "to sleep", not *ⲛⲅⲟⲧⲕ

Similar phenomena are known in several languages worldwide. In German, the sound [ŋ] appears 1) as a combinatory variant of /n/ before /k/, and 2) as the phonetic realization of /ng/ which cannot be pronounced *[ŋg] or *[ng] within a morpheme. Sanskrit has a specific letter to express the sound [ŋ]. This letter is used 1) to substitute /n/ before velars, 2) to substitute /k/ before nasals, 3) in word-final position to substitute the sequence -/nk/ (e.g. *prāŋ* "being in front [nom. sg.]", stem **prānk-*).

The sequence /mk/ can also appear as ⲙⲅ, however this case is rare (cf. Ernštedt 1986: 109). I suggest that ⲙⲅ was pronounced [mŋ]:

- ^{s}ⲟⲩⲱⲙⲅ /ˈwomk/ [ˈwomŋ] "to eat you" < *w(n)m-k*

3.3.8 The evolution of voiced stops in Late Coptic

3.3.8.1 Overview

It appears that Late Coptic (i.e.: Bohairic, ☞ § 2.2.2) experienced a major sound shift at a comparatively late time (approximately around 1300/1400 AD) when it had already ceased to be in productive written use: The distinction aspirate – non-aspirate in stops was transformed into a distinction voiceless – voiced. This is a specifically Coptic development which did not take place in Egyptian Arabic, although its motivation may lie in the fact that an opposition based on aspiration is unknown to Arabic.

The following qualifications have to be made:

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- Stops in word-final position did not become voiced, so the distinction of both series of stops was neutralized here.
- There is some evidence that voicing did not proceed consistently in Greek borrowings into Coptic. The original pronunciation of stops in these words was possibly conserved under the influence of contemporary Greek.
- Late Coptic was under strong pressure by Arabic and was gradually assimilated to Arabic in its phonology. Arabic has no /p/[83], and additionally early Egyptian Arabic probably lacked /g/ as did Classical Arabic[84]. These articulations seem to have likewise been absent in Late Coptic as far as we can judge from the available sources. The sound shift discussed here is therefore obscured in the velar and labial places of articulation and only visible in the dental and palatal stops. It is unclear whether the contrasts /b/ — /p/ and /g/ — /k/ did develop in Late Coptic and were subsequently eliminated due to pressure from Arabic, or whether the Arabic influence did not even let these contrasts arise.

The development of Late Coptic plosive articulations can be summarized as follows (excluding Greek loan words):

Bohairic character	original Bohairic pronunciation	hypothetical pronunciation of earlier Late Bohairic, still with specifically Coptic sounds	attested Late Coptic pronunciation with substitutions of sounds lacking in Arabic
ⲃ	*β*	*β*	*w*
ⲃ (word-finally)	*b*	*b*	*b*
ⲡ	*p*	*b*	*b*
ⲫ	p^h	*p*	*b* ~ *f*
ⲧ	*t*	*d*	*d*
ⲧ (word-finally)	*t*	*t*	*t*
ⲑ	t^h	*t*	*t*
ϫ	*c*	*ɟ*	*ɟ* (Cairene g)
ϭ	c^h	*c*	*ʃ*
ⲕ	*k*	*g*	*k*
ⲭ	k^h	*k*	*k*

---

[83] This is true for the standard language as well as for most modern Arabic dialects (the Mesopotamian dialects excluded). Still today, most Egyptians substitute /p/ by /b/ in European loan words.

[84] Classical Arabic ج, conventionally transcribed ‹ǧ›, is derived from Proto-Semitic /g/ but was probably a palatal in Arabic proper (cf. Kaye 1972: 37f. who argues that the sound value was /ʒ/ in early Arabic). This phoneme is today realized as /ɟ/ in many areas of Egypt, as /d/ in some regions of Upper Egypt, and as /g/ in Cairo. The latter is clearly secondary (cf. e.g. the development of Classical Arabic *waǧh-* "face" > Cairene Arabic *wiʃʃ* which requires an intermediate stage such as **wiʒh-*). Classical Arabic ق was originally a uvular or emphatic sound and is still spoken /q/ or /ɢ/ in many varieties of modern Arabic. However in the Egyptian dialects in which ج has not shifted to /g/, ق has filled this position and is spoken /g/ nowadays.

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3.3.8.2 *Details*

A 13th century Arabic version of the *Apophthegmata Patrum* written in Coptic letters (on this text ☞ § 2.10.1) still requires us to attribute the classical sound-values to the Coptic characters. The representations are as follows (based on Satzinger 1972: 49-53):

Arabic consonant		Coptic transcription
plain voiceless stops	*t*	Ⲑ, word-finally also Ⲧ
	k	Ⲭ, word-finally also Ⲕ
emphatic stops[85]	*ṭ*	Ⲧ, more rarely Ⲑ
	q	Ⲕ
plain voiced stops	*b*	Ⲡ
	d	Ⲇ

The Arabic dialect transcribed here lacks /p/, /g/, as well as /ḍ/. We observe that the Arabic opposition plain vs. emphatic is graphically expressed by an opposition aspirate vs. non-aspirate. Arabic voiced *d* is represented as Ⲇ; Arabic *b* is rendered as Ⲡ because Coptic had no letter clearly expressing a voiced bilabial stop (ⲃ was usually a spirant).

The situation is already changing, however, in a manuscript likewise dated to the 13th century citing Old French words and phrases in Coptic transcription (☞ § 2.10.4). We find here that French voiced stops are transcribed in Coptic not only by characters for voiced stops, but also by characters which in classical use denote non-aspirate voiceless stops, while French voiceless stops are frequently transcribed by the Coptic signs for aspirates:

French consonant	Example of transcription
b	ⲡⲉⲃ "bœuf"
p	ⲁⲡⲟⲥⲑⲗⲉ "apôtre", ⲫⲉⲣⲉ "père"
d	ⲗⲓⲟⲩⲛⲇⲓ "lundi", ⲧⲟⲩⲣⲙⲓⲣ "dormir"
t	ⲗⲁⲥⲧⲉⲗⲉϩ "l'étoile", ⲗⲁⲑⲁⲡⲛⲉϩ "la table"
g	ⲗⲁⲅⲁⲣⲥⲟⲩⲙ "le garçon", ⲗⲉⲙⲁⲛⲕⲁⲛⲓⲱϩ "le mangonneau"
k	ⲕⲁⲧⲣⲉϩ "quatre", ⲙⲉⲭⲉⲣⲇⲓ "mercredi"

A similar variation can be observed in the names of the Coptic letters recorded by Bernard de Breydenbach in 1486 (on these ☞ § 2.7.3). Here we find that Coptic voiceless stops are recorded as voiceless or voiced stops in free variation: ⲍⲏⲧⲁ "sytta", ⲓⲱⲧⲁ "ioda", ⲕⲁⲡⲡⲁ "caba", ⲡⲓ "by".

There is a manuscript containing Coptic texts written in Arabic letters, perhaps to be dated to the 18th century, which was published by Galtier (1906) (☞ § 2.9.4). The representations of the Coptic stops, according to Satzinger (1972: 53-60) and to my own observations, are summarized in the chart below. They are clearly different for native words and Greek loans.

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[85] Arabic *ṭ* is voiceless; *q* can be voiced or voiceless depending on the dialect.

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Bohairic	Arabic transcription of Coptic words	Arabic transcription of Greek loans
ⲃ	و /w/, word-finally ب /b/	و /w/
ⲡ	ب /b/	ب /b/
ⲫ	ب /b/ and ف /f/[86]	ف /f/
ⲇ	–	د /d/ and ظ /ð̣/
ⲧ	د /d/ ~ ض /ḍ/ ~ ظ /ð̣/, ت /t/ word-finally	ت /t/ ~ ط /ṭ/, rarely د /d/ ~ ض /ḍ/
ⲑ	ت /t/ ~ ط /ṭ/	ت /t/ ~ ط /ṭ/
ϫ	ج /ɟ/	–
ϭ	ش /ʃ/	–
ⲅ	–	غ /ɣ/ before back vowels, ج /ɟ/ before front vowels
ⲕ	ك /k/	ك /k/
ⲭ	ك /k/	خ /x/ before back vowels, ش /ʃ/ before front vowels

The difference between both sets of dental and palatal stops is clearly one of voice in native words (neutralized word-finally). For the labials and velars this cannot be verified for the reasons outlined above. Arabic plain and emphatic consonants are used in free variation.

The same results can be obtained from a Bohairic – Arabic – Gəʿəz glossary written in Ethiopic script from approximately the early 18th century. This text was published by Strelcyn (1957) (☞ § 2.9.3). The basic correspondences for stops in this text are the following:

Bohairic	Gəʿəz transcription of Coptic words	Gəʿəz transcription of Greek loans
ⲃ	*w*, but *b* word-finally	*w* ~ *b*
ⲡ	*b*	*b*
ⲫ	*b* ~ *f*	*f*
ⲇ	–	*d*
ⲧ	*d*, but *t* word-finally (and occasionally in other positions)	*t* ~ *ṭ* ~ *d*
ⲑ	*t*	*t*, *ṭ*
ϫ	*ž*	–
ϭ	*š*	–
ⲅ	–	*ž* before front vowel, *g* elsewhere
ⲕ	*k*	*k*, *q*
ⲭ	*k*	*š* before front vowel, *k* elsewhere

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[86] The fact is curious that ^{b}ⲫⲉ "heaven" is rendered as با /ˈba:/ but its plural ^{b}ⲫⲏⲟⲩⲓ "heavens" as فاوى /ˈfa:wi/ (Galtier 1906: 103).

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The fact that /p/ is not used here may be either due to Arabic influence or due to the fact that /p/ is an uncommon phoneme also in Gəʿəz (where however there is a letter for /p/ which is occasionally used in loan words). Nevertheless, the absence of /g/ must be assigned to an arabicized pronunciation of Late Coptic.

Our results are further confirmed by a Coptic text with an accompanying Latin transliteration which was added at some time between 1531 and 1718 (☞ § 2.9.7). The transcription is less consistent in this manuscript than in the two aforementioned texts, and there is no obvious difference in the behavior of native and Greek words. The principal correspondences are the following:

ⲃ	*ou* ~ *b* (especially in word-final position, but also elsewhere)
ⲡ	almost always *b*
ⲫ	*b* ~ *f*
ⲇ	most commonly *d*
ⲧ	*d* ~ *t* (the latter especially in word-final position)
ⲑ	almost always *t*
ϫ	most commonly *g*
ϭ	almost always *ch* (which is probably meant to represent /ʃ/)
ⲅ	most commonly *g*
ⲕ	usually *k* or *c* (= /k/), rarely *g*
ⲭ	usually *k* or *c* (= /k)

Latin *g* is used for rendering the palatal ϫ more frequently than for rendering ⲕ. This may indicate that *g* is primarily a rendering of a palatal here (as commonly before *e* and *i* in English, French, and Italian). It is also possible to assume that this variety of Late Coptic was influenced by the pronunciation of Cairene Arabic where *g* is a secondary substitution of former /ɟ/ or /ʒ/ (☞ note to § 3.3.8.1). The manuscript contains remarks pointing to a Cairene provenance (Cramer 1961: 94).

The voiced pronunciation of stops is also found in the Late Coptic pronunciation of the names of the Coptic letters, ☞ § 2.7.3.

Coptic borrowings into Arabic as well as place names that have entered the Egyptian-Arabic dialect may conform either to the traditional sound values of the Coptic characters, or – which is more frequent – to the Late Coptic sound values as outlined in this section. This is obviously a criterion for determining the time at which the words were taken over into Arabic.

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3.4 A phoneme /ʔ/ in Egyptian?

3.4.1 General considerations

Languages can be classified into three types with regard to the status of the so-called glottal stop /ʔ/. First, there are languages such as French or (standard) English in which the glottal stop is not regularly used, although it may sporadically be spoken at the beginning or end of a word in expressive utterances.

Second, there is German in which the glottal stop is frequently heard before a vowel, especially in word-initial position.[87] Its occurrence is automatic, and the omission of the glottal stop does not involve a change in meaning. We can say that the glottal stop is widely used in German but does not have the status of a phoneme. Not many languages behave like German in this respect; however another good example is Czech.[88]

Third, there are languages in which the glottal stop is a regular consonant that can appear anywhere in a word, and its occurrence is not predictable. To this type belongs e.g. Arabic (Standard Arabic as well as Cairene Arabic). In languages like these the glottal stop can be considered a phoneme.

3.4.2 Glottal stops in Coptic?

Although Coptic has no specific letter to express a glottal stop, most scholars assume that the so-called double vowels of Coptic are a graphic device for rendering glottal stops (☞ § 5.2.3.1). This would imply that the glottal stop unpredictably appears in word-internal position and would therefore be phonemic in Coptic. While some scholars reserve positing /ʔ/ in Coptic mainly for the case of double vowels (Kasser 1991a and 1991f; Vergote 1973/83: Ia, § 21 and Ib, §§ 26-28), others prefer to assume that glottal stops also preceded orthographic word-initial vowels. Hintze (1980: 39, 48-54) and Loprieno (1995: 41, 44) (cf. also Depuydt 1993: 345f. and Kammerzell 1998a: 28f.) posit numerous glottal stops for the phonological representation of Coptic, even in word-final position, which have no direct representation in writing.

However, I have rejected the presumed glottal stops in word-internal or word-final position in Coptic (☞ § 5.2.3.2 and note in § 5.3.4). If I am right, the possibility seems more

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[87] While most actual instances of the glottal stop are found in word-initial positon, the rule must be formulated in a somewhat more complex manner. We can say that a glottal stop is frequently inserted before a vowel: 1) either at the beginning of a word or morpheme (e.g. *Hausaufgabe* ['hausʔaufga:bə], or 2) even within a morpheme between two contiguous vowels (e.g. *chaotisch* [ka'ʔo:tiʃ], *Aorta* [ʔa'ʔɔrta:]). However the glottal stop is not obligatory and it may be omitted in any of these cases. There is large regional and idiolectal variation.

[88] This is obviously an areal feature. The habit to pronounce a non-phonemic [ʔ] was either taken from German into Czech or vice versa.

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remote that graphical word-initial vowels were preceded by a glottal stop in pronunciation. While such is indeed the case in German, we have to consider that German is quite unique in this point. The overwhelming majority of languages lacking glottal stops as regular phonemes do not use them as a marker of word boundaries either. If my rejection of word-internal and word-final glottal stops is agreed upon, it would seem quite natural that, for instance, a Coptic word like ⲁⲛⲟⲕ "I" was regularly pronounced [a'nɔk] rather than [ʔa'nɔk] (thus already Edgerton 1957: 136f.). I suggest that rare Coptic writing variants with superfluous ϩ [h][89] or glides[90] before word-initial vowels support the assumption that Coptic had a "soft" vowel onset instead of a glottal stop in word-initial position. In any case, there is no clear evidence for positing a phoneme /ʔ/ in Coptic.

It is nevertheless possible that glottal stops were introduced secondarily after Coptic had come under strong Arabic influence. According to Depuydt's (1993: 362) analysis of the use of the "djinkim" (☞ § 2.7.5) in Late Bohairic, punctuation in manuscripts since around 1400AD seems to indicate that words with graphical word-initial vowels were spoken with a preceding glottal stop.[91] This is evidently true for the modern liturgical pronunciation of Coptic, as well as for the modern scholarly pronunciation of Coptic at least in Germany. For example, the word ⲡⲱⲟⲩ "the glory" (ⲡ- definite article + ⲱⲟⲩ "glory"), written ⲡ̇ⲱ̇ⲟⲩ in Late Bohairic, is commonly pronounced [ʔib'ʔoːw] by the Copts of modern Egypt and [pə'ʔoːw] or [pə'ʔoːʔuː] at German universities, whereas I think the original pronunciation was simply /'pow/.

3.4.3 Glottal stops in Egyptian?

For Egyptian, the question is even more difficult to judge. While early scholars assumed that the elementary phonogram ‹ꜣ› was a sign for a glottal stop, this view can now be rejected (☞ § 3.11.2). Another possible candidate to represent a glottal stop is ‹i›. I support the view that the original sound value of ‹i› was probably /j/ rather than /ʔ/ (for discussion ☞ § 2.6.3.2). Since /j/ was frequently lost in the development of the language, ‹i› often came to indicate the presence of a vowel in word-initial position. There is no evidence that, after initial /j/ was dropped, its place was automatically filled by a glottal stop. While the Egyptian script is strictly consonantal in nature, it is

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[89] Occasionally to be found in all dialects, see Crum (1939: 632a), Crum & Winlock (1926: 245), Kahle (1954: I, 143).

[90] Unetymological ⲟⲩ before ⲱ/ⲟ and ⲉⲓ before ⲉ is occasionally found in some nonstandard Sahidic texts, e.g. ⲟⲩⲱⲃϣ ['woβʃ] instead of ^{s}ⲱⲃϣ /'oβʃ/ "to forget" and ⲉⲓⲉⲡⲓⲧⲣⲉⲡⲉ [jepitrepɛ (or similarly)] instead of ^{s}ⲉⲡⲓⲧⲣⲉⲡⲉ "to entrust", a borrowing from Greek ἐπιτρέπειν. See Crum & Winlock (1926: 238, 240, 242), Worrell (1923: 121), Kahle (1954: I, 83 and 91).

[91] However, Depuydt does not conclude, as I do, that the glottal stop was introduced only around 1400AD but rather argues that the rules of placing the *djinkim* changed at that time.

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nevertheless possible that it had a sign to indicate a mere vocalic word onset without necessarily implying a concomitant glottal stop articulation (similarly Vergote 1973/83: Ib: § 27). In modern Urdu, which is likewise written in a principally consonantal script, the letter ا (*ālif*) is used to indicate a word-initial vowel of any quality, although a glottal stop is not regularly spoken in this language.

3.5 ‹h› and ‹ḥ›

3.5.1 Places of articulation

In Egyptian-Semitic mutual transcriptions, ‹h› and ‹ḥ› consistently correspond to Semitic /h/ and /ħ/[92] respectively (Hoch 1994: 413, 432, 436). This suggests that the opposition of Egyptian ‹h› and ‹ḥ› was mainly one of the place of articulation. No dispute about this has arisen to date. The pharyngeal articulation of ‹ḥ› is also confirmed by its close relations to the phoneme /ʕ/ (☞ § 3.6.4).

3.5.2 Voiceless or voiced?

It can be observed that the vowel i_{low}, which normally developed into ^{s,b}ⲁ (☞ § 5.5), appears as ⲉ in Sahidic and Bohairic before ϩ < *h*:

- *nhzi̯* ('nihVzi̯V) "to awake" > ^{s}ⲚⲈϨⲤⲈ, ^{b}ⲚⲈϨⲤⲒ[93]

Before ϩ < *ḥ*, however, we have the regular development:

- *sḥn.t* ('siḥVntV) "to command" > ^{s}ⲤⲀϨⲚⲈ, ^{b}ⲤⲀϨⲚⲒ

In Bohairic and late Sahidic, the development i_{low} > ⲉ is regular before sonorants in general, ⲉ + sonorant probably being a secondary development from a former syllabic sonorant (☞ § 5.10.2). I therefore suggest that at a certain stage of the language ‹h› might have belonged to the class of sonorants. This would imply that *h*, as opposed to *ḥ*, was voiced. Voiced /h/ (this cannot actually be a fully voiced sound but a sound with incomplete vibration of the vocal cords, i.e. with breathy voice) is not uncommon in languages of the world. A "voiced" articulation is predominant for /h/ in languages such as Czech and Hindi, and a certain degree of voicing can even be found in the English /h/ (cf. Ladefoged & Maddieson 1996: 325f.). At some time *h* would have ceased to be a sonorant, and former syllabic *h* would have been replaced by the sequence ⲉϩ, thus anticipating a development which later affected all remaining syllabic sonorants.

It is presently impossible to decide whether the primary distinction of /h/ and /ḥ/ was one of voice or one of place of articulation.

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[92] IPA symbol for a voiceless pharyngeal spirant, conventionally transcribed as *ḥ* by Semitists.

[93] For further examples see Osing (1976: note 84 on p. 400), Satzinger (1979: 344 and 360), and Vycichl (1990: 221).

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The fact is curious that some assimilation processes which usually require the concerned sounds to be in direct contact with one another are not hindered by an intervening ϩ (< *h* as well as < *ḥ*). This is true for the developments a_{high} > ⲟⲩ and i_{low} (u_{low}) + *w* > ⲟ after nasals (☞ § 5.6.3.3) and for the assimilation ⲛ > ⲙ before labials (☞ § 3.16.1). For another similar phenomenon ☞ § 5.7.2. This seems to indicate that a graphic combination such as ⲛϩ was not pronounced as a sequence of two segments [nh] but rather as a single nasal consonant which may have been spoken half-voiced (with breathy voice).

In Hindi (and several other Indian languages) the written sequences *-nh-* and *-mh-* are pronounced as [n̤] and [m̤] with breathy voice, which some analyze as distinct phonemes (e.g. Hindi /kʊm̤ar/, conventional transcription *kumhār* "potter" < Sanskrit *kumbhakāraḥ*). On nasals with breathy voice in general cf. Ladefoged & Maddieson (1996: 107-109).

3.5.3 Merger of ‹h› and ‹ḥ› in Coptic

In Roman Demotic and contemporary hieroglyphic texts, graphical confusion arises between ‹h› and ‹ḥ›, which indicates that a phonetic merger had taken place by that time.[94] Both sounds conflate into ϩ /h/ in all Coptic dialects. At least by the present knowledge, etymological ‹h› and ‹ḥ› are not distinguished in Arabic loans from Coptic (see Hintze 1980: 68 and appendix 8).[95]

Greek /h/ is usually rendered as ϩ in Coptic. /h/ of Greek loans is, however, often written irregularly, i.e. ϩ may be omitted as well as added unetymologically. This may be due to a somewhat different pronunciation of /h/ in both languages, as well as to the tendency for /h/ to be lost in later Greek. In native words, ϩ is written consistently in most texts. Only in certain, primarily very early manuscripts can ϩ be omitted or written where it is not justified etymologically (cf. Kahle 1954: I, 139-143). This is probably due to the influence of Greek orthography where /h/ is not regularly written, rather than due to a phonetic reason. Furthermore, the Greek phonemic sequence /hi/ is sometimes rendered as ϣⲓ in Coptic, ☞ § 3.18.

3.6 The voiced pharyngeal fricative /ʕ/ (‹ʿ›)

Summary: A voiced consonant belonging to the dental series, most probably /d/, developed into a sound similar to Semitic /ʕ/ roughly around 2000BC. This sound was lost around the turn of the era, contemporaneously with its presumable voiceless counterpart ‹ḥ›.

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[94] See Lacau (1965: 12f.), Vergote (1973/83: Ib, § 28h). For doubtful earlier cases of confusion between *h* and *ḥ* cf. Osing (1976a: note 47 on p. 367f.).

[95] Schenkel (in preparation) is going to argue that the difference is actually preserved in Arabic loans in certain phonetic environments. I cannot discuss this here.

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3.6.1 The phoneme /ʕ/ in the 2nd and 1st millennia BC

In Semitic borrowings into Egyptian in the 2nd and 1st millennia BC, Semitic /ʕ/ is consistently rendered by ‹ʿ› (cf. Hoch 1994: 413, 431, 435). Vice versa, Egyptian ‹ʿ› is transcribed as ע /ʕ/ in the Hebrew Old Testament.[96] Where this sound still exists in modern Semitic languages, it is most commonly described as a voiced pharyngeal spirant. Ladefoged & Maddieson (1996: 168f.) suggest that the preferred realization of this phoneme in modern Arabic is more adequately to be described as an epiglottal approximant. For convenience, I will continue speaking of pharyngeals in this book, which does not imply a decision on its exact articulation.

Most scholars assume that Egyptian ‹ʿ› /ʕ/ was essentially the same sound as Semitic /ʕ/, and so do I. However some suggest that the Egyptian sound might have been somewhat different in nature, perhaps based on the consideration that /ʕ/ is, on the whole, a typologically rare sound among the world's languages. Vergote (1948: 64-66) assumes that ‹ʿ› was originally a /ʕ/ proper, but developed into a strong glottal stop /ʔ/ already in the Old Kingdom, where for a long time it was still kept distinct from ‹ꜣ› which according to Vergote was a weaker glottal stop (on ‹ꜣ› ☞ § 3.11.2). Kammerzell (1995: L) suggests that ‹ʿ› was an unmarked voiced sonorant of undetermined place of articulation which he transcribes /ə̯/. Cf. also Kammerzell (1998a: 30): "(...) by loss of dinstinctive features an original voiced dental stop /d/ became a neutral consonant possessing only one marked feature, [+voice]."

3.6.2 The emergence of /ʕ/

When Otto Rössler examined the rules of consonantal root incompatibilities of Egyptian (☞ § 4.11), he concluded that the sound transcribed ‹ʿ› must originally have belonged to the dental series (Rössler 1971: 276f.). He then proposed several etymologies linking Egyptian ‹ʿ› to Semitic /d/ and /ð/ (Rössler 1971: 285-288). A shift of a dental stop to /ʕ/ is attested in Aramaic which clarifies that such a development is possible. Rössler's idea was subsequently accepted by most Egyptologists who have expressed their view on the topic.[97] Let us now discuss the time at which the sound shift /d/ > /ʕ/ took place.

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[96] /ʕ/ cannot be clearly expressed in the Akkadian cuneiform syllabary. This sound is either substituted by *ḫ* or omitted altogether (e.g. Egypt. ‹wʿw› "soldier" is transcribed as *ú-e-eḫ*, *ú-e-e*, *WI-a* etc., see Ranke 1910: 19), as is /ʕ/ in borrowings or transcriptions from other Semitic languages into Akkadian.
Ernštedt (1986: 57-59) argues that Egyptian ‹ʿ› (and ‹ḥ›) can be represented as /h/, before front vowels occasionally as /ha-/, in Greek transcriptions.

[97] However, Conti (1976: 52f.) and Osing (1997) give more weight to the old etymological connections of Egyptian ‹ʿ› to Semitic /ʕ/ – which are few in number – than to Rössler's evidence. Conti opposes the idea that consonantal compatibility restrictions can be used for determining places of articulation.

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The Egyptian word for “one” is *wꜥw* > Coptic ^{s}ⲟⲩⲁ, ^{b}ⲟⲩⲁⲓ. The loss of final *-w* indicates that the stressed vowel cannot have directly preceded *-w* (☞ § 3.14.2.3) but rather must have preceded ꜥ. However the Coptic stressed vowel ⲁ only appears when an odd number of consonants follow (☞ § 4.2), thus *wꜥw* > ⲟⲩⲁ is one of the words which contradict the syllable structure rules. Schenkel (1990: 55) proposes to reconstruct the Paleo-Coptic form of the word as (wŭ́ꜥꜥuw) assuming a geminate (ꜥꜥ) to increase the total number of consonants by one.[98] He links the word to the Semitic root √*wḥd* (e.g. Arabic واحد *wāḥid-* “one”) and assumes that the Egyptian geminate -(ꜥꜥ)- arose from an earlier cluster -/ḥd/-. Semitic /d/ regularly corresponds to Egyptian ‹ꜥ›, but the development of Semitic /ḥ/ to ‹ꜥ› is abnormal. One possibility is to assume that /ḥ/ was assimilated to the following ‹ꜥ›. According to Schenkel, this assimilation probably took place at a time when ‹ꜥ› was already spoken /ʕ/ since /ħ/ and /ʕ/ share the same place of articulation. As *wꜥw* is written as such from the Old Kingdom on and no writing **wḥꜥw* is ever attested, Schenkel (1990: 55), and similarly Loprieno (1995: 31), therefore attribute the sound change /d/ > /ʕ/ to a very early time.

We should note that Schenkel’s reasoning does not agree with the syllable theory proposed in this book since the structure (ˈCVCCVC) is not accepted here. It is further to be remarked that Semitic *ḥ* can be absent in Egyptian cognates without any indication that assimilation took place, cf. the independent personal pronoun 1st pl. Hebrew אֲנַחְנוּ *ʾănaḥnū* – Egyptian *ỉnn* (ia'nanV) > ^{s,b}ⲁⲛⲟⲛ.

Kammerzell expresses another view which I consider more cogent. He has assembled a number of lexical doublets which are attested in writings both with ‹ꜥ› and with ‹d›.[99] Writings with ‹ꜥ› occur at all times, whereas ‹d› is only attested from the New Kingdom on. All of these words, if still present in Coptic, have ⲧ in all dialects.[100] Kammerzell links the appearance of ‹d› in these words to the phonetic shift /d/ > /ʕ/.[101] This can be

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[98] Whereas Edel (1961: 105) and Osing (1976a: note 800 on p. 697-700) argue in favor of a reading *wꜥjw*.

[99] Kammerzell (1991c: 9), an unpublished investigation which has recently become accessible in Satzinger (1999). Examples are *ꜥꜣ* > *dï* > ^{s,b}ⲧⲁⲓ “here”, *ꜥb* > *db* > ^{s,b}ⲧⲁⲡ “horn”, and *m-ꜥ* > *m-dj* > ^{s,b}ⲛⲧⲉ- “near, with”.

[100] This is not quite true for *ꜥb* “horn”, since in addition to ^{s,b}ⲧⲁⲡ “horn” there is a rare Bohairic noun ϩⲁⲡ ~ ϩⲱⲡ ~ ϩⲱⲃ “horn” which likewise seems to be cognate with *ꜥb*. The development ‹ꜥ› > ϩ is not quite regular (☞ § 3.6.4.3). Word-final *-b* develops into -ⲡ in Coptic (☞ § 3.12.4), so final -ⲃ in ϩⲱⲃ must be derived from an extended form, probably the plural *ꜥb.w* “horns”. I suggest the following scenario. For some reason or another, /d/ was preserved only in the singular of *ꜥb*, while the plural experienced the regular development /d/ > /ʕ/. This must have led to a hypothetical alternation ⲧⲁⲡ (sg.) ~ ϩⲱⲃ (pl.). ϩⲱⲡ and ϩⲁⲡ may be contaminations of both forms. Since by the time of Coptic the category of number was largely lost in nouns, all forms became interchangeable, and in most varieties of Coptic only ⲧⲁⲡ survived.

[101] Schenkel gives a diatopic explanation of the shift ‹ꜥ› – ‹d›, ☞ § 3.2.2 for discussion.

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understood as follows: Originally ‹ʿ› expressed the sound /d/. Not too long before the New Kingdom most occurrences of /d/ shifted to /ʕ/ by a sound change. Nevertheless, the writing with ‹ʿ› was left unchanged, so the primary phonetic value of the grapheme ‹ʿ› was now reinterpreted as /ʕ/. However in some words the sound /d/ was exceptionally preserved for a reason which is still to be clarified.[102] Since ‹ʿ› was no longer a useful letter for rendering /d/ by the New Kingdom, there was a need to change the graphical expression of /d/ in the minority of the words in which /d/ had been retained. Egyptian scribes chose the sign ‹ḏ› which normally renders the phonetically close sound /t/. It seems that the exceptionally preserved /d/-sound soon merged with /t/ also in the spoken language. In any case, both are undistinguishable in Coptic.

	/d/ (most)	/d/ (some)	/t/
Earlier Egyptian	/d/ ‹ʿ›	/d/ ‹ʿ›	/t/ ‹ḏ›
Later Egyptian	/ʕ/ ‹ʿ›	/d/ ‹ḏ›	/t/ ‹ḏ›

At a first glance, this suggests that the sound change took place little earlier than the New Kingdom. In the earliest extant transcriptions of Semitic names from the Middle Kingdom however, it is not Semitic /d/ but already Semitic /ʕ/ which is transcribed by Egyptian ‹ʿ›.[103] This suggests that the sound change had already begun in the Middle Kingdom and ‹ʿ› could already then be spoken close to [ʕ] at least in certain words.
From the Old Egyptian period, however, Kammerzell still found alliterations ‹ʿ› /d/ – ‹ḏ› /t/ in poetic textual passages (see Kammerzell 1998a: 36 for an example).

The verb *šʿ* "to cut" is largely replaced by *šʿd* from the New Kingdom on (*šʿd* is attested first in the 2nd Intermediate Period). Coptic has ^{S}ϣⲱⲱⲧ, ^{A}ϣⲟⲩⲟⲩⲧ. *šʿd* seems to be the result of a contamination of two coexisting forms with /d/ and /ʕ/ respectively.

3.6.3 The loss of /ʕ/

In Roman Demotic ‹ʿ› suddenly begins to be employed in a very inconsistent manner.[104] It is often omitted or added without etymological justification. I take this as an indication that the phoneme /ʕ/ was lost from the spoken language (thus also Vergote 1973/83: Ib, § 28e-g, Osing 1980b: 947 and, less decidedly, Loprieno 1994: note 57 on p. 131 and 1995: 46 and note 55 on p. 248. Till 1929 believes, although with reservations, that /ʕ/ is still preserved in Coptic.). No trace of /ʕ/ is left in Arabic borrowings from Coptic.
A loss of /ʕ/ can currently be observed in Maltese, a dialect of Arabic. In the Maltese standard orthography, ‹għ› is written where the consonant /ʕ/ is to be expected

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[102] Satzinger (1999) remarks that ‹ʿ› is followed by a voiced consonant in all the words concerned.

[103] Semitic *ʿbd* "servant" as an element of proper names is rendered as Egyptian ‹ʿpr› several times (Rössler 1966: 222f.).

[104] Cf. Spiegelberg (1925: 4f.) and Lexa (1949: I, §68-72, 145-147).

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etymologically. However no consonantal /ʕ/ is commonly spoken any longer.[105] Instead the neighboring vowel (or vowels which are contracted) are spoken as a long vowel with pharyngeal coarticulation or creaky voice. It is not evident from this pronunciation whether /ʕ/ was originally to the left or to the right of the pharyngealized vowel: /ʕa/, /aʕ/, and /aʕa/ all become /a̰ː/. Furthermore, there is a strong tendency in recent Standard Maltese for this coarticulation to be abandoned, so the pharyngealized vowels become indistinguishable from non-pharyngeal long vowels. For example, *xagħar* "hair" < Classical Arabic *šaʕr-* شعر is spoken /ˈʃa̰ːr/ (with pharyngeal a̰ː) or /ˈʃaːr/. In the latter case, the word sounds just as *xahar* /ˈʃaːr/ "month" < Classical Arabic *šahr-* شهر (Puech 1994: 15). It is possible that the loss of /ʕ/ in Egyptian proceeded in a similar way.

3.6.4 Some exceptional sound developments of /ʕ/

3.6.4.1 Dissimilation in the neighborhood of ‹ḥ›

After ‹ꜥ› adopts the sound value /ʕ/, there is a tendency for it to undergo dissimilation to ‹j› in the neighborhood of ‹ḥ›.[106] This ‹j› is preserved or lost in Coptic like the original ‹j› (for the rules ☞ § 3.14.2). Examples:

- *ꜥḥ* "palace" is also written *i͗ḥ* since the Middle Kingdom; not preserved in Coptic
- *mḥꜥw* "flax" > **mḥiw* (written *mḥw*, *mḥꜥi* et var.) > ^{s}ⲙⲁϩⲉ
- *qꜥḥ.w* "corner of the eye" > *qjḥ.(w)* > ^{s}ⲕⲁⲓϩ (see Černý 1976: 68 and Osing 1976a: 244)

The loss of ‹ꜥ› in the neighborhood of ‹ḥ› is confirmed by the lack of certain traces which ‹ꜥ› normally leaves in Coptic (cf. Vergote 1973/83: Ib, § 28g and § 36):

The vowel a_{low} is preserved as ⲁ in Sahidic (as opposed to its regular change into ⲟ) when directly preceding ‹ꜥ› (☞ 5.6.2.3). In words which also contain ‹ḥ› this effect is absent:

- *sꜥḥꜥ* (ˈsaʕVḥʕV) "to reprove" > **siḥi* > ^{s}ⲥⲟⲟϩⲉ
- *i͗ꜥḥ* "moon" > **i͗i͗ḥ* (transcribed as *ja* in cuneiform at the time of the New Kingdom, Albright 1946a: 13f.)> ^{s}ⲟⲟϩ
- *qꜥḥ* "corner" > **qiḥ* > ^{s}ⲕⲟⲟϩ.

Now consider the phenomenon of vowel lengthening (☞ § 5.5.10.2). There is vowel lengthening due to the loss of ‹ꜥ› from positions in which ‹j› also causes lengthening, such as:

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[105] The loss of /ʕ/ in Maltese seems to be a recent phenomenon. Vanhove (1991/92) still met a speaker who was born around 1910 and lived in an isolate area of Malta who pronounced a consonantal /ʕ/ in certain words.

[106] The phenomenon has not yet been studied in detail but several scholars have noticed it (e.g. Czermak 1931/34: 186; Černy 1942: 335 with note 3; Fairman 1943: 250f.; Jansen-Winkeln 1996: § 50; Osing 1976a: note 247 on p. 513, note 373 on p. 538f., note 679 on p. 654, note 906 on p. 746f. and 1976c: note 118 on p. 144; Polotsky 1931: 75f.; Vergote 1973/83: Ib, § 28g; Vycichl 1959a: 55f. and 1990: 253f.).

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- *sʿḥʿ* (ˈsaʿVḥʿV) “to reprove” > **sjḥj* > ^{s}ⲥⲟⲟϩⲉ /ˈsɔːhə/ (like *bin.t* “bad [fem.]” > ^{s}ⲃⲟⲟⲛⲉ /ˈβɔːnə/)
- *wḥʿ.t* (ˈwaḥVʿtV) “scorpion” > **wḥj.t* > ^{s}ⲟⲩⲟⲟϩⲉ /ˈwɔːhə/ (like *rri.t* “sow” > ^{s}ⲣⲁⲁⲣⲉ /ˈraːrə/).

However examples like
- *ʿḥʿ* (ˈʿaḥʿV) “to stand” > ^{s}ⲱϩⲉ /ˈohə/
- *wḥʿ* (ˈwaḥʿV) “fisherman” > ^{s}ⲟⲩⲱϩⲉ /ˈwohə/

indicate that ‹ʿ› must have been lost early since final ‹ʿ› normally lengthens the stressed vowel as in
- *ḏbʿ* (ˈḏubʿV) “finger” > ^{s}ⲧⲏⲏⲃⲉ /ˈteːβə/

The example *ḥʿ-f* (ˈḥaʿfV) “his body” > ^{s}ϩⲱⲱϥ /ˈhoːf/ seems to contradict my statement because ‹j› would not have caused vowel-lengthening in this position. Perhaps the long vowel is due to analogy with cases like *ḥʿ-ṯn* (ˈḥaʿVṯnV) “your (pl.) body” (not preserved in Coptic).

3.6.4.2 Dissimilation in the neighborhood of ‹ḫ› (‹ẖ›)

There are several words in which *i* and *ʿ* are confused from the Middle Kingdom on if the same word also contains the velar fricative ‹ḫ› (perhaps also ‹ẖ›), e.g.:
- *m.ʿnḫ.t* “tassel” (since OK) > *m.inḫ.t* (since MK)
- *itḫ* “to brew” (OK) > *ʿtḫ* (since MK)

For other relevant examples see Osing (1980a), Vycichl (1990: 254f.), Westendorf (1962: § 57). All examples show ‹i› / ‹ʿ› in morpheme-initial position. There are no indications that ‹ʿ› in other positions was affected.

Theoretically two interpretations are possible here. Either the sound expressed by ‹i› changed into the sound expressed by ‹ʿ›, or the sound expressed by ‹ʿ› changed into the sound expressed by ‹i› in the environment of ‹ḫ›. The Semitic words *ʔx* “brother” and *ʔxt* “sister” as elements of proper names are found as *ʿḫ* and *ʿḫt* respectively in Egyptian transcriptions from the Middle Kingdom (Schneider 1987: 264). Egyptian ‹i› is a normal rendering of Semitic *ʔ*, but Egyptian ‹ʿ› is not. This clarifies that the second alternative is to be preferred. I therefore propose the following scenario:

When ‹ʿ› adopted the value /ʕ/ at about the time of the Middle Kingdom, it could be dissimilated to ‹i› (probably = /j/) in the neighborhood of ‹ḫ›, as it was in the neighborhood of ‹ḥ›. From this time on, the graphical opposition between ‹ʿ› and ‹i› was neutralized in the neighborhood of ‹ḫ›, so both writings appeared in free variation.

This sound change also explains the etymology *ḫy* “to be high, long” (since NK, > ^{s}ϣⲓⲁⲓ) < *ʿḫi̯* “to lift” (since MK, > ^{s}ⲉⲓϣⲉ).

3.6.4.3 *Devoicing to ‹ḥ›*

Egyptian /ʕ/ was occasionally devoiced to /ħ/ and then retained in Coptic as ϩ. This development is found primarily in Bohairic, but is by no means regular. The following list contains all the examples I am aware of:

- *ꞽꜥꜣ.w*, plural of *ꞽꜥꜣ* "ass" > ^{s}ⲉⲟⲟⲩ, ^{b}ⲉϩⲉⲩ~ⲉⲉⲩ, the base form seems to have been (i[V]ʕ'ꜣVwV)[107].
- *ꜥb* "horn" > ^{b}ϩⲁⲡ~ϩⲱⲡ~ϩⲱⲃ (☞ note in § 3.6.2)
- *pnꜥ* "to turn" > ^{s}ⲡⲱⲱⲛⲉ, ^{b}ⲫⲱⲛϩ
- *mšꜥ* ('mašʕV) "to walk" > (*'mašḥV) > ^{s}ⲙⲟⲟϣⲉ, ^{b}ⲙⲟϣⲓ, ^{a}ⲙⲁⲁϩⲉ. This verb appears as *msḥ* in Napatan Egyptian (cf. Wb II, 147,1 and Peust 1999).
- From the verb *nꜥi̯* "to be merciful" there is a Coptic derivation ^{s}ⲛⲁⲏⲧ, ^{b}ⲛⲁⲏⲧ ~ ⲛⲁϩⲏⲧ "merciful"[108]
- *nqꜥ.t* "pains at birth" > ^{s}ⲛⲁⲁⲕⲉ, ^{b}ⲛⲁⲕϩⲓ, ^{a}ⲛⲉⲕ(ϩ)ⲉ
- *ẖꜥq* "to shave" > ^{s}ϩⲱⲱⲕⲉ, ^{b}ϧⲱⲕ~ϧⲱⲕϩ
- *ḫfꜥ* "fist" > ^{s}ϩⲱϩϥ (from *ϩⲱϥϩ with metathesis)[109]
- *šnꜥ* "to repulse" > ^{s}ϣⲱⲱⲛⲉ, ^{b}ϣⲟⲛϩ- (status pronominalis)
- *glꜥ* "to swathe" (since Demotic) > ^{s}ϭⲱⲱⲗⲉ, ^{b}ϫⲱⲗ~ϫⲱⲗϩ
- *ḏqꜥ* "to prick" (since Demotic) > ^{s}ϫⲱⲱⲕⲉ, ^{b}ϫⲟⲩⲕϩ

These cases have to be distinguished from writings of superfluous ϩ in certain early Coptic texts which do not reflect a former ‹ꜥ› (☞ § 3.5.3).

3.6.4.4 *Interchange with sonorants*

There seem to be a few examples of a variation ‹ꜥ› ~ ‹ꞽꜣ› at the beginning of a word, which in phonetic terms would indicate a variation /d/ ~ /r/. An example is the word for "cattle". While in most writings the word onset is not clearly indicated phonetically, there are phonetic renderings as both *ꜥw.t* (rarely in the Old and New Kingdoms, cf. Lesko 1982-1990: I, 71) and *ꞽꜣw.t* (frequently in the New Kingdom). On this phenomenon see further Sethe (1899-1902: I, § 148), Czermak (1931/34: 117f., 135f.), Vergote (1948: 65f.), and Westendorf (1962: § 31.7).

An exceptional sound change ‹r› > ‹ꜥ› is attested in *msḏr* "ear" (since Old Kingdom). This word is attested in a by-form *msḏꜥ* from the New Kingdom on. *msḏꜥ* must also be the

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[107] Osing (1976a: 438, 756) suggests (jVꜥ*ꜣ.wVw) – which in our notation would be (iV'ꜥVꜣVwwV) – adding a fictive *-w* to the consonantal frame. On this solution cf. Schenkel (1979: 383). For possible Afroasiatic cognates of the ass-word see Vergote (1969: 88) and Behrens (1984/85: 175) both of whom transcribe the Egyptian as *ꜥꞽꜣ*.

[108] Bohairic ⲛⲁϩⲏⲧ is rare; the development ϩ < ꜥ is proposed by Vycichl (1983: 230). Another possibility is that the form was influenced by the noun ^{b}ϩⲏⲧ "heart" (thus Osing 1976a: note 1362 on p. 865).

[109] See Osing (1976a: note 547 on p. 597) and Vycichl (1983: 320).

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base for the Coptic forms (^{s}ⲙⲁⲁϫⲉ, ^{b}ⲙⲁϣϫ, ^{f}ⲙⲉⲉϫⲉ).[110]

There are some words in which ‹ꜥ› following ‹ḥ› developed into ‹r› in the Middle Kingdom (rule by Wolfgang Schenkel, personal communication):

- *ꜥḥꜥ.w* "treasuries" (since OK) > **iḥr.w*[111] > ^{s}ⲁϩⲱⲱⲣ, ^{b}ⲁϩⲱⲣ
- *ḥꜥpï* "Nile" (since OK) is also written *ḥrp* (and *ḥpr* with graphical metathesis) in the MK (Wb III 42 and de Buck 1935-1961: VII, 346c B3C) (not preserved in Coptic)
- *ḏḥꜥ* "leather" (since MK), also written *ḏḥr* since MK[112] (not preserved in Coptic)

There are a few more words in which ‹ꜥ› is represented as ⲣ, ⲗ, or ⲛ in Coptic outside this condition, which seems to be due to a later process:

- *ꜥẖmw ~ ꜥšmw ~ ꜥḫmw* "twigs" > ^{b}ⲗⲁϭⲉⲙ (for the Egyptian word see von Deines & Grapow 1959: 108f.; etymology by Vycichl 1990: 110)
- *smꜣꜥ.ti* "to be praised (stative)" > ^{b}ⲥⲙⲁⲣⲱⲟⲩⲧ (uncertain; for an alternative etymology cf. Černý 1971: 46)
- *ḏi̯.t-ꜥšꜣ* "to multiply" > ^{s}ⲧⲁϣⲟ, ^{b}ⲧⲁϣⲟ~ⲧⲁⲛϣⲟ
- Perhaps: *šꜣꜥ-i̯.iri̯.t-f* (end of New Kingdom) "until he does" > Demotic *šꜥt-f ~ šꜥmt-f* > ^{s}ϣⲁⲛⲧ-ϥ-, ^{a}ϣⲁⲧⲉ-ϥ-, ^{b}ϣⲁⲧⲉ-ϥ- ~ (more rarely) ^{b}ϣⲁⲛⲧⲉ-ϥ- (conjugational prefix terminative 3.sg.masc.). I assume, however, that the forms with ⲛ are actually derived from Late Egyptian/ Demotic *(r)-šꜣꜥ-m-ḏr-* "since (has been doing)", cf. de Cenival (1984: 220f.) and Černý & Groll (1993: §§ 32.6-32.8).

3.6.4.5 Interchange with ‹z›

There are rare cases of graphical confusion between ‹ꜥ› and ‹z›, e.g.:

- *ꜥbš ~ zbš* "to drown" (both Old Kingdom, see Allen 1984: 554)
- *qꜣꜥ* "to vomit" (since MK) > ^{s}ⲕⲁ-ⲃⲟⲗ, attested as *qꜣs* in the early New Kingdom and again in Ptolemaic Neo-Middle Egyptian (see Westendorf 1962: § 31.7)

See in general Kammerzell (1991c: 10, 12 and 1992/93: 249) where additional examples are cited. Kammerzell assumes that we have an inherited phoneme /z/~/ð/ (or similar) here for which Egyptian had no distinct grapheme. Another possible assumption would be that the sound shift /d/ > /ʕ/ proceeded through an intermediate stage /ð/ (or similarly) which evoked occasional writing variants with ‹z›.

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[110] On this word see Vycichl (1983: 132). Vycichl (1940: 81) argues that ‹ꜥ› does not express a consonant here but merely indicates the feature which surfaces as a double vowel in Coptic (vowel length in my interpretation). While this might be a possible function of Demotic ‹ꜥ›, I hesitate to assume that ‹ꜥ› could already express mere vowel length in the New Kingdom since we would expect many more writings with unetymological ‹ꜥ› in that case.

[111] Not attested as such, but the phrase *m-ꜥḥꜥ.w-j* "by my treasuries" in the Story of Sinuhe is miswritten as *m-ḥr-j* "in my face" in two Ramesside manuscripts, cf. Černý (1942: 335f.) and Koch (1990: 53).

[112] See Dévaud & Sethe (1910: 163), Jansen-Winkeln (1996: § 50), and the attestations in de Buck (1935-1961: IV 12b and V 86a, 88b).

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3.7 Velar plosives

3.7.1 Overview

There are four elementary graphemes in Egyptian to render velar plosives. They correspond to two letters for velars as well as two letters for palatals in Coptic. The functional correlation between the hieroglyphic and the Coptic graphemes is weak. In particular, any hieroglyphic grapheme can appear both as a velar and as a palatal in Coptic. The following is an overview of the correspondences, accompanied by tentative sound values for Late Egyptian:

velar no.	1	2	3	4	5	6	7
hieroglyphic grapheme	𓎡		𓈎		𓎼	𓏌 ~ 𓎼	𓎼 ~ 𓈎
conventional transliteration of the hieroglyphic grapheme	‹k›		‹q›		‹g›	‹g›	‹g›~‹q›
Late Egyptian sound value	/k^h/		/k_1/	/k_1^w/	/k_2/	/k_2^w/	/q/
Bohairic Coptic (before a stressed vowel)	ϭ /c^h/	ⲭ /k^h/	ϫ /c/	ⲕ /k/	ϫ /c/	ⲕ /k/	?
Sahidic Coptic	ϭ /kj/	ⲕ /k/	ϭ /kj/	ⲕ /k/	ϭ /kj/	ⲕ /k/	?

General remarks on the opposition ‹k› — ‹g› — ‹q›

It is evident from Bohairic that ‹k› denotes an aspirate as opposed to both ‹g› and ‹q›. It is far more difficult to define the distinction between the sounds noted by ‹g› and ‹q›. When transcription symbols for 𓎼 and 𓈎 had to be selected, scholars chose ‹g› and ‹q› because they were easy to reproduce typographically and were also used for transcribing Semitic languages, although no clear evidence on the actual sound values of these Egyptian signs was available (cf. Steindorff 1892: 719). The phonetic interpretations thus assigned arbitrarily to both graphemes were confirmed much later by Rössler (1971: 304-306). Based on etymological considerations, he assumes that ‹ḏ› and ‹i› are the palatalized correlates of ‹q› and ‹g› respectively, which would suggest that ‹q› is a voiceless (according to Rössler: emphatic) and ‹g› a voiced velar. Rössler's view was accepted by subsequent scholars such as Schenkel (1990: 51) and Schneider (1995: 193). Egyptian-Semitic mutual transcriptions are, on the other hand, too variable to clarify the question (cf. Hoch 1994: 428f.).

I hesitate to make a decision on the phonological distinction between ‹q› and ‹g› and therefore render them by the unspecific symbols /k_1/ and /k_2/ respectively.

General remarks on the opposition ⲕ/ⲭ — ϫ/ϭ

There is no indication that any of the above mentioned sounds was a palatal in earlier times. It is noteworthy that practically all velars in Semitic loan words which entered Late Egyptian appear as palatals in Coptic (☞ appendix 5 and below, for possible exceptions see discussion on velar no. 6 below). This shows that palatalization applied

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after the New Kingdom (for details ☞ 3.9.4.2).
Palatalization applies to ‹g› in most cases, to ‹k› in roughly half of the cases, and to ‹q› in a minority of cases.

3.7.2 Velars no. 1/ 2: Egyptian /k^h/ ‹k›

Palatalization can probably be predicted by the environment, ☞ § 3.9.4.3. This implies that there was not yet a phonological distinction between ‹k› > ϫ/ⲕ and ‹k› > ϭ in Late Egyptian.

3.7.3 Velar no. 3: Egyptian /k_1/ ‹q›

This phoneme is absent in Old Egyptian.[113] Only from the Middle Kingdom on do a limited number of instances of this phoneme appear, several of which render /q/ in obvious loan words from Semitic. Since Semitic /q/ was probably not a palatal (virtually all its reflexes in modern languages have velar, uvular, or glottal articulations), it is clear that palatalization applied only after these words had entered the Egyptian language.
The phoneme /k_1/ can be assumed for the following words (a judgement is possible only for words which have survived in Coptic):

First attested in the Middle Kingdom

- *ἰ3q.t* "leek" > ^{s}ⲏϭⲉ, ^{b}ⲏϫⲓ (from the Semitic root √*wrq* "green" which is genetically related to Egyptian *w3ḏ* "green", initial *j-* instead of *w-* pointing to North-West-Semitic origin, cf. Hebrew יֶרֶק "vegetables")
- *ḥ3q* "to capture", in Coptic still present in the derivation ^{s}ϩⲁ(ⲁ)ϭⲉ, ^{b}ϩⲁϫⲓ "snare". Perhaps borrowed from the well-known Semitic verb √*lqḥ* "to take" (e.g. Hebrew

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[113] I reject the accepted etymology *qd* "character, nature, manner" (attested from OK on) > ^{s}ϭⲟⲧ, ^{l,f}ϭⲁⲧ "size, form, sort" (missing in Bohairic). The Coptic word is feminine so that a gender change must be assumed. Furthermore, *qd* ceases to be a productive noun in Demotic and becomes restricted in use to the complex preposition *m*(*i*)-*qd* "like". (To the best of my knowledge, the early papyrus Vandier is the only Demotic text to make use of *qd* in isolation, see Posener 1985: 104.) It is difficult to see how out of this a productive noun could again have emerged in Coptic.
I also reject the etymology *sqr* ~ *sq* "to hit, to strike" (from OK on) > ^{s}ϣⲱⲱϭⲉ, ^{a}ϣⲟⲩⲟⲩϭⲉ "to smite, to wound" proposed by Osing (1976: note 219 on p. 506f.). He explains the development *s* > *š* as an assimilation to ϭ. However, we would not expect ϭ < *q* to provoke assimilation at a distance (☞ § 3.16.5). The fact is also suspicious that the word is consistently written with ‹š› already in Demotic (Erichsen 1954: 525).
I propose that both Coptic words are late borrowings from Semitic (cf. Arabic قدّ *qadd-* "stature, figure, size" and شجّ *šaǧǧa* "to break, to cleave, to split").

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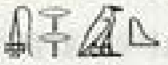
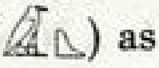
לְקַח).[114] The complex metathesis can be compared to the cases cited by Vycichl (1984: 396).

- *qi* "form" > ^{s}ϭⲓ-, ^{b}ϫⲓ- (nominal prefix)
- *qnị* "to be strong" > ^{b}ϭⲛⲟ, (stative:) ^{s}ϭⲉⲛⲛⲏⲩⲧ. Perhaps cf. Arabic قوى *qawiya* "to be strong"
- *qnd* "to be angry" > ^{s}ϭⲱⲛⲧ, ^{b}ϫⲱⲛⲧ (linked to Middle-Hebrew *qnṭ* "to be angry" by Rössler 1966: 228)
- *qḥqḥ* "to hammer (metal)" > ^{s}ϭⲁϩϭϩ~^{s}ϫⲁϩϫϩ, ^{b}ϫⲁϩϫⲉϩ

First attested in the New Kingdom

- *šḥq* "dust" > ^{s}ϣϩⲓϭ, ^{b}ϣϩⲓϫ, cf. Hebrew שַׁחַק "dust" (Hoch 1994: no. 411)
- *qmꜣ* "bull (?)"[115] > ^{s}ϭⲁⲙ (missing in Bohairic)
- *qri* "to visit" > ^{s}ϭⲟⲉⲓⲗⲉ, ^{b}ϫⲱⲓⲗⲓ, with nominal (*qri* "visitor") and adverbial (*r-qri* "near") derivations, on this word cf. Meeks (1997: 49f.). Several Semitic roots have been proposed as etyma, and a decision is difficult to make on semantic grounds: √*qrʾ* (*Hoch* 1994: nos. 430 and 431), √*gwr* (Hoch 1994: nos. 428 and 429, Kitchen 1993), √*glw* (Vycichl 1983: 336). For phonetic reasons, I prefer the first alternative.
- *qrʿ* "shield" > ^{s}ϭⲗ (missing in Bohairic), cf. Ugaritic *qlʿ* "shield", Arabic قلع *qilʿ* "sail" (☞ appendix 5)
- *qrr.t* "burnt-offering" (since Dynasty 20) > ^{s,b}ϭⲗⲓⲗ. To be derived from the Semitic root √*qlʾ* "to burn" (e.g. Hebrew קָלָה, Arabic قلو "to burn"). In addition to the palatalization of ‹q›, there are two reasons to assume that *qrr.t* is not directly derived from the Egyptian verb *qrr* "to burn": 1) *qrr* is attested in the Old and Middle Kingdoms only; 2) the earliest attestations of *qrr.t* from Dynasties 20 and 21 are written in group-writing  which is typical of loan words (☞ § 5.4.2). The verb *qrr* "to burn" is either inherited from Proto-Afroasiatic or borrowed from Semitic √*qlʾ* at a much earlier time.
- There is a noun *glṯ* of feminine gender in Demotic whose meaning is given as δακτύλιος "ring" by a Greek translation (*Canopus decree*, Spiegelberg 1922: 198). A connection seems possible to the late Egyptian feminine noun *qrt* () as well as to the Sahidic noun ϭⲗⲧⲉ of indeterminable gender. Both these words are attested only once, and their semantics cannot be defined precisely by the contexts. See Westendorf (1965/77: 453) and Grandet (1994: II, note 854 on p. 207).
- *qq* "to eat"> ^{s}ϭⲱϭ, ^{b}ϫⲱϫ "to roast, to bake, to cook (i.e. to prepare food)" (etymology by Peust 1999)
- *qḏ* "safflower *or similarly*" > ^{s}ϭⲟⲩϫ, ^{b}ϫⲟⲩϫ "safflower", cf. Hebrew קוֹץ "thornbush" (☞ appendix 5).
- *qḏm* (a measure), a hapax legomenon which might be related both to the Semitic root

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[114] Already compared by Cohen (1947: no. 442) who, however, does not assume a borrowing but a genetic relationship.

[115] On this word see Grandet (1994: II, note 526 on p. 134).

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√*qmṣ* (assuming metathesis) and to ^{s}ϭⲁϫⲙⲏ "handful" (Hoch 1994: no. 446). Another possibility is to connect this word to *gḏ* > ^{s}ϭⲓϫ, ^{b}ϫⲓϫ "hand", see Meeks (1997: 50).

First attested after the New Kingdom

- Demotic *iṟ ḫrḏ* "to grind one's teeth" > ^{s}ϩⲣⲟϫⲣϫ, ^{b}ϧⲣⲁϫⲣⲉϫ, cf. Hebrew חָרַק "to grind one's teeth".
- Sahidic ϭⲗⲙⲁⲓ and variants (type of pottery), from Aramaic *qlby* (Westendorf 1965/77: 452).

3.7.4 Velar no. 4: Egyptian $/k_1^w/$ ‹q›

Whereas palatalization of ‹k› seems to be bound to phonetic conditions, palatalization of ‹q› cannot be predicted. We therefore have to consider velar no. 4 to be a phoneme on its own which has always been distinct from velar no. 3. The nature of the opposition is, however, not immediately evident. It is only clear that it cannot have originally been one of velar vs. palatal places of articulation (☞ discussion on velar no. 3).

We find that /n/ preceding velar no. 4 can appear as /m/ in Coptic (recognized already by Sethe 1899-1902: I, § 227a), just as it often does preceding ‹m›, ‹p›, or ‹b› (☞ § 3.16.1):

- *ʿnq* "to (make) flow *or similarly*" > ^{s,b}ⲱⲙⲕ /ˈomk/ "to swallow"
- *ḥnq.t* "beer" > ^{s}ϩⲛⲕⲉ /ˈhn̩kə/, ^{b}ϩⲉⲙⲕⲓ /ˈhɛmki/
- *snq* "to sick" > ^{s}ⲥⲱⲛⲕ~ⲥⲱⲙⲕ, ^{b}ⲥⲱⲛⲕ
- *dj-snq* "to suckle" > ^{s}ⲧⲥⲛⲕⲟ~ⲧⲥⲙⲕⲟ
- *qnqn* "to beat" > ^{s}ⲕⲙⲕⲙ et var "to play a musical instrument".

From this admittedly weak evidence I conclude that velars no. 3 and no. 4 were originally distinguished by the absence or presence of the feature [*labial*]. There is no way of knowing whether these labialized velars were spoken with lip-rounding ($/k^w/$) or with double closure ($/\widehat{kp}/$). Wherever I indicate phonetic interpretations in this book, I will render velar no. 4 as $/k^w/$ for convenience, but this is nothing more than an ad-hoc decision.

In a New Kingdom magical text there appears to be a word play involving *nhp* "morning" and an obscure word *nhq* (Westendorf 1962: § 39). This seems to support the assumption that ‹q› could have had a labial coarticulation.

Edel (1988) identifies *dïqȝiȝz*, a transcription of a foreign toponym from the New Kingdom, with the Greek name Θηβαίς which appears as *te-qa-* in linear-B texts. The correspondence Greek β – linear-B *q* clearly points to the early Greek phoneme $/g^w/$. If Edel's identification is correct, it confirms the labiovelar character of Egyptian ‹q›.

While the grapheme ‹q› most commonly expresses velar no. 4 in native Egyptian words, there is no evidence that velar no. 4 ever occurred in loan words from Semitic. I have no example of a word borrowed with ‹q› which turned out as non-palatalized ⲕ in Coptic.[116]

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[116] Cf. Vergote's (1945: 40) remark: "Le *qof* des mots d'emprunt sémitiques semble avoir adopté de préférence l'articulation postpalatale".

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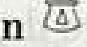
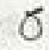
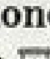
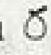
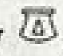
I therefore assume that wherever ‹q› appears in (New Kingdom or earlier) Semitic loans, it should be interpreted either as a velar no. 3 or a velar no. 7 rather than a velar no. 4. This agrees with my phonetic interpretation of velar no. 4: Labiovelars are not known in North-Western Semitic languages.

3.7.5 Velar no. 5: Egyptian $/k_2/$ ‹g›

This is a common Egyptian phoneme, and most instances of written  ‹g› belong here. Velar no. 5 can also appear in loan words from Semitic (e.g. *ʿgrt* "wagon" > ^{s}ⲁϭⲟⲗⲧⲉ, ^{b}ⲁϭⲟⲗϯ~ⲁϫⲟⲗϯ, from Semitic **ʿagalt-*, Hoch 1994: no. 100).

3.7.6 Velar no. 6: Egyptian $/k_2^w/$ ‹g›

Frank Kammerzell discovered that the use of the monoconsonantal sign  ‹g›, which traditionally has been considered a mere allograph of  ‹g›, predicts that no palatalization takes place by the time of Coptic.[117] The sign  is, however, not obligatory in these words but can always be replaced by , and it becomes more and more obsolete from the New Kingdom on.

The opposition between velars no. 5 and no. 6 cannot have originally been one of palatal vs. velar place of articulation (☞ § 3.7.1). Instead it is possible that velar no. 6 had an additional feature [+ *labial*], just like velar no. 4.[118] Frank Kammerzell shows that velar no. 6 is found most frequently – though not always – in the neighborhood of the vowel /u/ or one of the consonants ‹b› or ‹w›; it seems plausible that these sounds have evoked an assimilatory labialization of the velar. Therefore it is possible that velars no. 5 and no. 6 were not distinctive phonemes but allophones in Egyptian. Consider also a case of morphological alternation in the root *gꜣw*. While the infinitive *gꜣw* (ˈgaꜣwV) "to be narrow" develops into ^{s}ϭⲱⲟⲩ (palatalization, velar no. 5), the participle, which is also to be vocalized as (ˈgaꜣwV), develops into ^{s}ⲕⲟⲩⲓ "narrow" (no palatalization, velar no. 6).[119]

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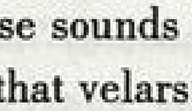
[117] This study is not yet published. For the time being cf. Kammerzell (1998a: 37). One of Kammerzell's examples is the name of the town Coptos  *gbtw* > ^{s}ⲕⲏⲃⲧ.

[118] I have not found cases of /n/ preceding velar no. 6 to check whether the assimilation /n/ > /m/ takes place.

[119] See Osing (1976a: note 602 on p. 608f.) and Vycichl (1983: 73).

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No certain example of velar no. 6 is known to occur in a loan from Semitic.[120]

3.7.7 Velar no. 7: Egyptian /q/

Several words show a graphic variation of ‹g› and ‹q› during the New Kingdom. This graphical variation is unknown in earlier periods. I suggest that the variation indicates a specific phoneme: velar no. 7. Two such words are already attested in the Old Kingdom, both of which have the meaning "to be weak":

- *gbgb*, in NK also *qbqb* > ^{s}ϭⲃϭⲱⲃ- (hapax legomenon in Coptic). This is obviously related to *gbi̯* "to be weak" (attested since MK) > ^{s}ϭⲃⲃⲉ of which, however, there is no New Kingdom rendering with *q*.[121]
- *gnn*, in NK also *qnn*[122] > ^{s,b}ϭⲛⲟⲛ

These roots seem to be native, at least as far as can be concluded from their early attestation. However Ward (1986: 81) remarks that *gbi̯* and *gbgb* are frequently found in group writing (☞ § 5.4.2) which seems to suggest that there was some "foreign" coloring in them.

Two more such words are attested from the Middle Kingdom on:

- *qfn* "to bake" ~ *gf(n?)* (cf. Janssen 1975: 327f.) which is preserved – with metathesis – in the Coptic ^{b}ⲕⲉⲛⲉⲫⲓⲧⲉⲛ (kind of bread). A possibly related word exists in Berber, cf. Kabyle *əknəf* "to cook" (Vycichl 1983: 83f.).
- *dqr* "fruit" > ^{s}ϯϭⲉ, ^{b}ϫⲓϫⲓ, quite frequently written *dgr* / *dgꜣ* during the New Kingdom. There is also a verb *dgr* "to plant" which is attested from the NK on and is

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[120] But cf.:
- *sg* "sackcloth" > ^{s,b}ⲥⲟⲕ *et var.*, a wandering word, cf. Hebrew שַׂק *śaq* "sackcloth", Greek σάκκος, English "sack" (Hoch 1994: no. 383). This word is certainly a borrowing into Egyptian; it is, however, possible that it was borrowed from a language other than Semitic
- *gsr* "ring" (a hapax legomenon) > ^{s}ϩⲟⲩⲣ, ^{b}ϣϭⲟⲩⲣ possibly from the Semitic root √*qṯr* "knot, band, ornament" (Hoch 1994: no. 523; Vittmann 1996: 444). The Bohairic form as well as the rare Sahidic by-form ϭⲥⲟⲩⲣ indicate that we probably have velar no. 5 rather than velar no. 6 here.
- On the presumed Semitic loan word *ʿgs* cited by Hoch (1994: no. 102) see Meeks (1997: 39).

[121] The roots *gbi̯* and *gbgb* are discussed by Ward (1986).

[122] Infinitive *qn* once in Dynasty 20 (*Late Ramesside Letter* 16,7, see Wente 1967: 51 note c on top). The *sḏm-f*-form is attested once each as *qnn-f* and *sqnn-f* "respectively (*Dua-Khety*, see Helck 1970: 47; *sgnn* "to make weak; to soften" is a causative derivation from *gnn*). Furthermore there is a noun *sgnn* "ointment" which is written *sqnn* a few times (see Lesko 1982-1989, 3, 110) > ^{s}ⲥⲟϭⲛ, ^{b}ⲥⲟϫⲉⲛ. This noun might be a derivation from *sgnn* "to soften" or else from *qnn* "to be fat" (since MK) > ^{s}ⲕⲛⲛⲉ, ^{b}ⲕⲉⲛⲓ. It was borrowed into Greek as ψάγδᾱν *et var.* "kind of ointment" (Fournet 1989: 66).

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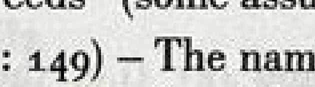
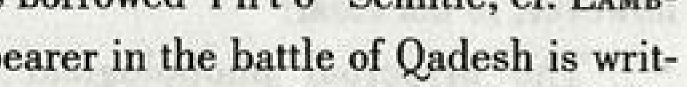
regularly written with ‹g›. The word may be an early loan from the Semitic root √*tkl* "to plant" (cf. Gəʿəz *takala* "to plant", Leslau 1987: 573).

But the clear majority of words containing velar no. 7 are attested not earlier than the New Kingdom, many of which can clearly be identified as loans from Semitic. It appears that velar no. 7 is the regular representative of a Semitic uvular fricative /ɣ/, but Semitic /q/ can also be rendered as velar no. 7. Semitic /g/ is rarely or never so, nor is /k/.

- Velar no. 7 representing Semitic /ɣ/: See e.g. Hoch (1994: nos. 228, 575) and the transcription of the town *Gaza* (Semitic **ġazzat-*) as *gḏt* or *qḏt* in Egyptian (Gardiner 1947: I, 191*). Somewhat doubtful for phonetic and semantic reasons is the connection of Late Egyptian *i͗dnrg~i͗drq* > ^{s}ϭⲗⲟϭ /'kʲlɔkʲ/, ^{b}ϭⲗⲟϫ (name of a vegetable) with a Semitic root √*dlʕ* (cf. Modern Hebrew דְּלַעַת *dəlaʕat* "pumpkin"), cf. Hoch (1994: no. 43), Meeks (1997: 36f.), and Ward (1996: 27). ϭⲗⲟϭ is probably preserved in the Greek compound κολοκ-ύνθη "colocynth" (Westendorf 1965/77: 455).
- Velar no. 7 representing Semitic /q/: See Hoch (1994: nos. 126 [relationship to ^{s}ⲉⲃⲣⲏϭⲉ, ^{b}ⲉⲃⲣⲏϫ "lightning" uncertain], 214, 217).
- Two doubtful representations of Semitic /g/ are: *qr~gr* "end of a papyrus" from Semitic √*gly* (Hoch 1994: no. 427), *šgr~šqr* (an undetermined object) from Semitic √*sgr* (Janssen 1975, 200-203 and note 119 on p. 162; Wb IV, 550, 1 and 10).
- To this group also belong some Late Egyptian words of uncertain etymology, such as *i͗rgs* ~ *i͗rqs* ~ *i͗qs* ~ *i͗rs* (name of a commodity; see Janssen 1965/66: 446 and 1975: 149f.) – *nqr* and *ngꜣ~ngr* "sieve" (Janssen 1975: 147) – *ḥmꜣg.t* ~ *ḥmq* (name of a mineral; see Caminos 1954: 442) – *gf~qf* "to be astonished" (Fischer-Elfert 1986: 95, note c) – *gmy* ~ *qmy* (name of a plant) which Caminos (1954: 167f.) connects to ^{s,b}ⲕⲁⲙ "reeds" (some assume that this word was borrowed into Semitic, cf. Lambdin 1953a: 149) – The name of a Hittite shield bearer in the battle of Qadesh is written *grbws*  (*Ramesseum*, twice) and *qrbws*  (*Abu Simbel*) (Schneider 1992: no. N 471). An identification with a Hittite name has not yet been proposed.

I conclude that the graphical variation *g* ~ *q* represents a specialized phoneme used only or primarily in loan words which I tentatively note as /q/. This phoneme might have been characterized by a back and/ or emphatic articulation but was non-distinctive with regards to the feature that distinguished ‹q› and ‹g›, as can be judged from the graphical variation. It is unclear how this phoneme developed after the New Kingdom. The possible Coptic etymological cognates, most of which are not certain, are contradictory (^{s}ⲉⲃⲣⲏϭⲉ, ^{s}ϭⲃϭⲱⲃ-, ^{s}ϭⲗⲟϭ, ^{s,b}ϭⲛⲟⲛ, ^{s}ϯϭⲉ show palatalization; ^{s,b}ⲕⲁⲙ, ^{b}ⲕⲉⲛⲉⲫⲓⲧⲉⲛ do not).

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3.7.8 Summary: the system of velar plosives at four different stages of Egyptian

Old Egyptian

We can only distinguish three phonemes which neatly correspond to the three graphemes: ‹k› renders an aspirate /k^h/ or a phoneme that develops into an aspirate later, ‹q› and ‹g› render two non-aspirate phonemes the distinction between which cannot yet be determined. The phoneme ‹q› seems to be labialized; similarly ‹g› might have a labialized allophone.

Middle and Late Egyptian

Favored by the increasing number of Semitic loan words, a new non-labialized phoneme /k_1/ appears which comes to constrast with /k_1^w/, but both are indiscriminately written as ‹q›. The grapheme ‹g› also covers two sounds [k_2] and [k_2^w], however it is not clear whether they contrast phonologically with one another.

Another phoneme is introduced principally for use in Semitic loan words. This phoneme might have a back and/ or emphatic articulation and can tentatively be symbolized as /q/. It is expressed either as ‹g› or – more rarely – as ‹q› in writing.

So in total we have 5 or 6 phonemes: /k^h/, /k_1/, /k_1^w/, /k_2/, /k_2^w/ (or [k_2^w]), and /q/. They are rendered by only three different graphemes (or by four if we consider the marginal grapheme ϭ). Labialization is largely ignored in writing, and there is no sign to unambiguously indicate /q/.

Immediately following Dynasty 20, much confusion arises in writing velar stops, and it is unclear how graphemes and phonemes relate at that time. All we can say is that on the way to Coptic five developments must have taken place, the relative chronological order, however, is not clear:

- The principal phonological distinction of ‹q› and ‹g› (i.e. the feature that distinguishes /k_1/ and /k_1^w/ on the one hand and /k_2/ and /k_2^w/ on the other) is lost.
- With the increasing integration of the Semitic loan words the phoneme /q/ seems to fall out of use.
- The feature [+/- labial] is replaced by a distinction velar vs. palatal.
- The aspirate stop develops a back versus front distinction as well.
- The distinction of aspiration comes to be restricted to a single dialect (Bohairic) where furthermore it is maintained only immediately before the stressed vowel.

Bohairic Coptic

Two velar and two palatal phonemes are distinguished in writing: /k/ Ⲕ, /k^h/ Ⲭ, /c/ Ϫ, /c^h/ Ϭ. The palatals have conflated with the original palatals ‹ṯ› and ‹ḏ› (at least in writing).

Sahidic Coptic

The opposition of aspiration is lacking (or at least not expressed in writing), leaving two phonemes /k/ Ⲕ and /k^j/ Ϭ. However the palatal which has developed from the velars (Ϭ) is still kept distinct from the original palatal Ϫ /c/ < ‹ṯ› / ‹ḏ›.

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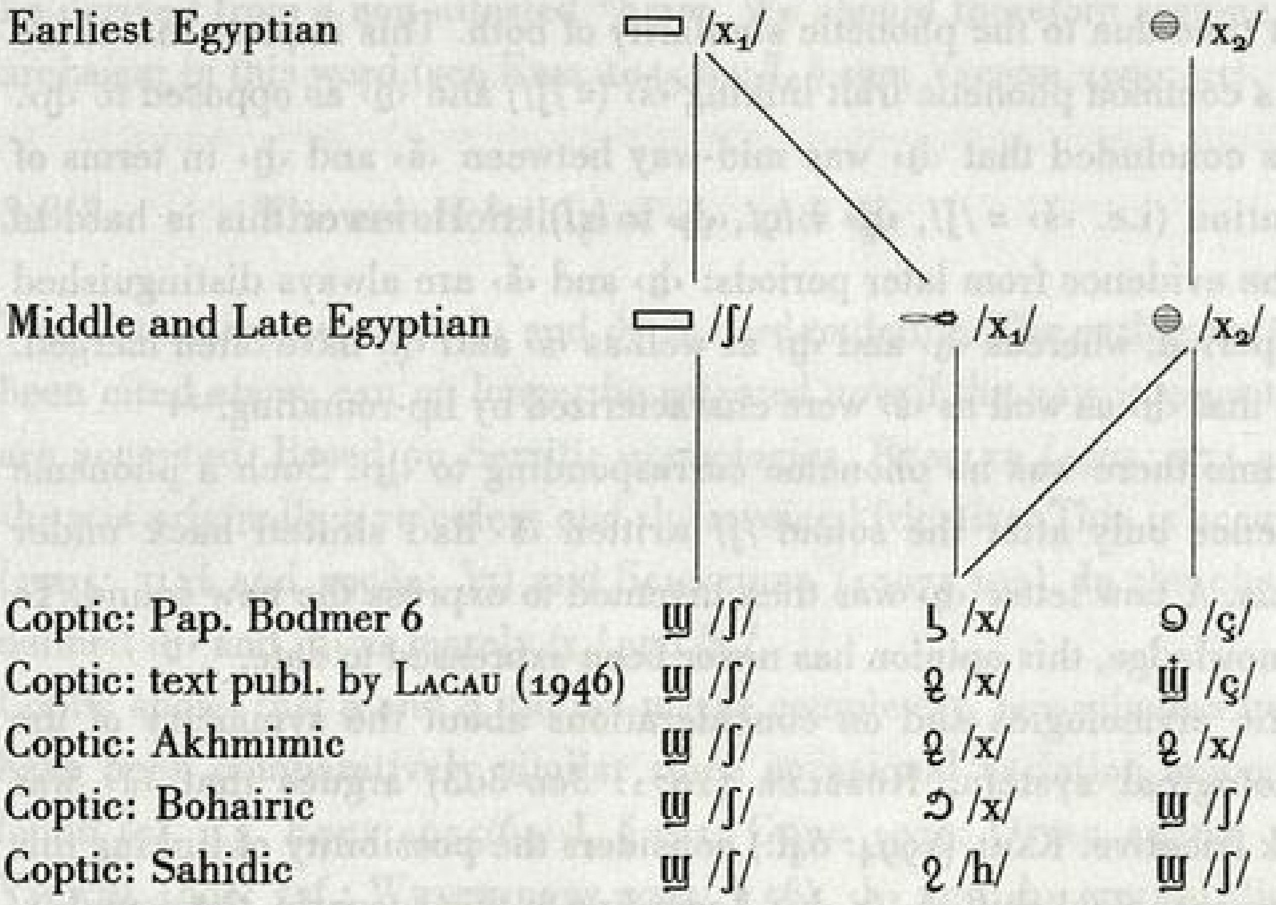
3.8 Velar fricatives

3.8.1 Summary of diachronic correspondences

I suggest the following scenario for the development of back fricatives:



Earliest Egyptian	𓈙 /x_1/		𓐍 /x_2/
Middle and Late Egyptian	𓈙 /ʃ/	𓄡 /x_1/	𓐍 /x_2/
Coptic: Pap. Bodmer 6	ϣ /ʃ/	ⳅ /x/	ⳋ /ç/
Coptic: text publ. by Lacau (1946)	ϣ /ʃ/	ⳉ /x/	ϣ̇ /ç/
Coptic: Akhmimic	ϣ /ʃ/	ⳉ /x/	ⳉ /x/
Coptic: Bohairic	ϣ /ʃ/	ϧ /x/	ϣ /ʃ/
Coptic: Sahidic	ϣ /ʃ/	ϩ /h/	ϣ /ʃ/

Twice in the history of Egyptian we can observe palatalizations of velar fricatives: First, in the Old Kingdom many instances of /x_1/ are palatalized whence a new distinction /x_1/ vs. /ʃ/ arises. Another palatalization affects /x_2/ in the 1st millenium BC, but – at least in the long run – this does not create a new phoneme since where /x_2/ is not palatalized, it merges with /x_1/. In most Coptic dialects additional subsequent mergers take place, ☞ § 3.8.3 for details.

Note the following conventional transcription symbols used throughout the text: 𓐍 ‹ḫ›, 𓄡 ‹ẖ›, 𓈙 ‹š›.

3.8.2 The relationship of ‹ẖ› and ‹š›

In the early days of Egyptology the signs for ‹ḫ› and ‹ẖ› were believed to have had an identical sound value and were transcribed indiscriminately as ‹ḫ› or ‹χ›. Steindorff (1892: 712f. and 727) was the first to observe that the reflexes of 𓐍 and 𓄡 are still partly differentiated in Coptic and thus he concluded that they were elementary graphemes of different phonetic value. He invented the transcription symbol ‹ẖ› for the latter but he had no idea on the nature of the phonetic distinction.

The elementary grapheme ‹ẖ› is attested first at the end of Dynasty 3 (26th century BC). Before this sign came into use, another sign ‹š› was employed where later ‹ẖ› would be written (see Kahl 1994: 63-65 and 615-619). The creation of the new letter ‹ẖ› led to a graphemic split. In many words previously written with ‹š› a graphical shift to ‹ẖ› took

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place (e.g. ‹pšr› "to go around" > ‹pẖr›), whereas in other words ‹š› was preserved in writing. The graphical substitution of ‹š› by ‹ẖ› in the Old Kingdom can be explained in (at least) three ways:

1) Although the Classical Egyptian grapheme ‹ẖ› was not in use in the earliest alphabet, the corresponding sound already existed. However this sound was written ‹š› (= /ʃ/) at that time due to the phonetic similarity of both. This implies that there must have been a common phonetic trait linking ‹š› (= /ʃ/) and ‹ẖ› as opposed to ‹ḫ›. A lot of scholars concluded that ‹ẖ› was mid-way between ‹š› and ‹ḫ› in terms of place of articulation (i.e. ‹š› = /ʃ/, ‹ẖ› = /ç/, ‹ḫ› = /x/).[123] However this is hard to reconcile with the evidence from later periods: ‹ẖ› and ‹š› are always distinguished until the Coptic period, whereas ‹ẖ› and ‹ḫ› as well as ‹š› and ‹ẖ› have often merged. Others proposed that ‹ẖ› as well as ‹š› were characterized by lip-rounding.[124]
2) In the earliest time there was no phoneme corresponding to ‹ẖ›. Such a phoneme came into existence only after the sound /ʃ/ written ‹š› had shifted back under certain conditions. A new letter ‹ẖ› was then invented to express the new sound. To the best of my knowledge, this opinion has never been expressed to date.
3) Based on Semitic etymologies and on considerations about the symmetry of the Egyptian phonological system, Rössler (1971: 300-303) argues that ‹š› was originally a back fricative. Kahl (1994: 64f.) considers the possibility of linking this observation to the graphical shift ‹š› > ‹ẖ›: According to this scenario, the sound /x/ corresponding to ‹š› was frequently palatalized to /ʃ/ in the Old Kingdom. The grapheme ‹š› which formerly had expressed a back fricative thus became primarily a means of writing a palatal fricative. In the minority of words in which /x/ escaped palatalization, the preserved back fricative now had to be expressed by a different sign for which ‹ẖ› was invented. Kammerzell (1995: XLVI and 1998a: 37f.) decidedly opts for this scenario.

Solution 3) seems the most preferable since it can explain the emergence of the grapheme ‹ẖ› and agrees with the subsequent sound developments on the way to Coptic and, as it appears, with Afroasiatic etymologies as well. Schneider (1997) proposes several etymologies relating Egyptian ‹š› to Semitic ‹ḥ› such as Egyptian *ḏšr* "red, yellow", *ḏšr.t* "desert" – Semitic √*ṣḥr* "red, yellow", Arabic *ṣaḥrāʾ*- "desert" which has yielded 'Sahara' in English (Schneider's no. 113).

The conditions for the palatalization of ‹š› /x/ are not known. There is perhaps a connection to the palatalization of back stops discussed in § 3.9.2.

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[123] This opinion was first expressed by Sethe (1899-1902: I, § 262) and was adopted by most subsequent scholars, e.g. Czermak (1931/34: 76-78), Edel (1955/1964: § 120), Vergote (1973/83: Ib, § 25), Osing (1980b: 945), Vycichl (1990: 51), and Loprieno (1995: 33, 35).

[124] Worrell (1934: 38) considers ‹ẖ› a voiceless uvular fricative with accompanying lip-rounding, a view which is accepted by Albright (1934b: 222).

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While the palatalization started in Dynasty 3 and the new sign ‹ẖ› came into use for expressing the non-palatalized sound, some of the words that evaded palatalization could still be written with ‹š› by historical orthography until Dynasty 6. The verb *šmm* "to be warm" retains its original writing with ‹š› throughout all periods,[125] but nevertheless seems not to have undergone palatalization. The Coptic equivalent ^{s}ϩⲙⲟⲙ, ^{b}ϧⲙⲟⲙ must be derived from a non-attested **ẖmm*. We should therefore assume a specific graphical archaism in this word (see Edel 1955/64: I, § 120; Vycichl 1990: 51).

3.8.3 The relationship of ‹ẖ› and ‹ḫ›

The distinction between ‹ẖ› and ‹ḫ› is hard to define. The earlier assumptions which have been cited above can no longer be retained now if the new interpretations of ‹ẖ› and ‹š› are accepted. Based on Semitic etymologies, Rössler (1971: 274 and 296f.) states that ‹ẖ› was originally a voiceless and ‹ḫ› a voiced fricative. This is accepted by Kammerzell (1995: xlvi and 1998a: 37) and Schneider (1997: 192). In the chart in § 3.8.1, I have defined ‹ẖ› and ‹ḫ› as merely /x_1/ and /x_2/.

Coptic shows that *ẖ* and *ḫ* did not merge completely, nevertheless both sounds appear to have been comparatively similar since occasional variation among both signs can be found (cf. e.g. Edel 1955/64: I, § 121; Görg 1979; Osing 1976a: note 926 on p. 762; Vycichl 1990: 52f.; Westendorf 1962: § 56). ‹ẖ› and ‹ḫ› are not distinguished at all in early renderings in other writing systems. At the time of the New Kingdom, both are transcribed as *ḫ* in cuneiform (there is however only a single uncertain example for ‹ẖ›: *ḫu-ni-ma* from the el-Amarna archive for *ẖnmw* "jug with one handle"[126]). The noun *ẖrd* "child" is perhaps represented as *ḫrd* in Ugaritic transcription (Watson 1995: 545). Both sounds are rendered without distinction as *ḥ* in Aramaic transcriptions and as *k~ḥ* in Phoenician transcriptions of the mid 1st millennium BC (Muchiki 1994).

Egyptian ‹ḫ› frequently substitutes Semitic /x/ in New Kingdom loans (Hoch 1994: 411f., 432). On the other hand, ‹ẖ› is never used in rendering any foreign name or word in New Kingdom Egyptian texts.

3.8.4 Late Period palatalization and mergers in Coptic dialects

In Coptic, ‹ḫ› is palatalized in some environments and dialects whereas ‹ẖ› never is. The Greek renderings already agree with the Coptic stage and transcribe ‹ḫ› sometimes as χ

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[125] Along with rare writings ‹ḫmm›. The causative formation ‹sšmm› is attested once as ‹sẖmm›.

[126] See Lambdin (1953b: 365) and Osing (1976a: I, 249).

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~ κ, sometimes as σ for [ʃ][127], but ‹ẖ› consistently as χ ~ κ.[128] There is not yet a trace of palatalization of ‹ẖ› in the Aramaic (e.g. *mḫjr* for the name of the 6th Egyptian month, ☞ appendix 6) and cuneiform transcriptions of the mid 1st millennium.

Palatalization of ‹ẖ› appears in Coptic as follows:

- Akhmimic shows no trace of palatalization, at least in writing. ‹ẖ› always develops into ⳉ.
- In a few archaic texts, there are specialized letters for palatalized ‹ẖ› (ϴ in Papyrus Bodmer VI, around 400AD, see Kasser 1960: xxi; and ϣ̇, this is the letter ϣ /ʃ/ augmented by a diacritic sign, in a fragmentary early text published by Lacau 1946).
- In most Coptic dialects, palatalized ‹ẖ› fuses with ‹š› and is written ϣ. Perhaps this is only a graphical merger, though.

‹ḫ› and non-palatalized ‹ẖ› merge in all varieties of Coptic.

Egyptian	*hꜣi̯* "to fall"	*ḫ.t* "manner"	*ẖr* "street" (non-palatalized *ẖ*)	*ẖt* "wood" (palatalized *ẖ*)	*šm.t* "to go"	number of graphical contrasts
Akhmimic	ϩⲉⲉⲓⲉ	ⳉⲉ	ⳉⲓⲣ	ⳉⲉ	ϣⲉ	3
pBodmer VI	ϩⲉⲉ	ⳋⲉ	ⳋⲓⲣ	ϴⲉⲉ	(ⲙⲁ)ϣⲉ	4
Bohairic	ϩⲉⲓ	ϧⲉ	ϧⲓⲣ	ϣⲉ	ϣⲉ	3
Sahidic	ϩⲉ	ϩⲉ	ϩⲓⲣ	ϣⲉ	ϣⲉ	2

Conditions for the palatalization of ‹ẖ› are not known, ☞ § 3.9.5.

3.8.5 The development ‹ẖ› > ⲕ

In rare cases ‹ẖ› develops into Coptic ^{s}ⲕ, ^{b}ϫ. Consider the following etymologies, not all of which are certain:

- *mnẖ* "to chisel" (see Wilson 1997: 435) > ^{s}ⲙⲟⲩⲛⲕ "to produce, to form" which however may also derive from *mnq* "to fulfill".
- Demotic *nḏẖ* "to sprinkle" > ^{s}ⲛⲟⲩϫⲕ, ^{b}ⲛⲟⲩϫϧ with variants. This is a loan from Semitic, cf. Arabic *nḍḥ* ~ (more rarely:) *nḍḫ*, Gəʿəz *nzẖ* ~ *nzḥ* "to sprinkle".
- *ẖꜣꜥ* "to put" > ^{s}ⲕⲱ, ^{b}ⲭⲱ. This is the most certain example.
- *ẖnp* "to steal" > ^{b,l}ⲕⲱⲗⲡ. For doubts about this etymology see Westendorf (1965/77: 508f.). It should be noted that the representation of *ẖ* as ⲕ in Bohairic does not agree with the example *ẖꜣꜥ* > ^{b}ⲭⲱ.

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[127] The name of king Kheops, Egyptian *ẖwi̯-f-wj*, appears in Greek transcription e.g. as Χεοψ (Χεοπ-) (Herodotos; hence the form current in English) and Σουφ(ις) (Manethon), cf. Lloyd (1975-1988: III, 62f.). The proper name *nẖt-nb-f* is transcribed in Greek e.g. as νεχθενιβ(ις), νεκθνιβ(ις), νεκτνηβ(ις), and νεσθνηφ(ις), cf. Lüddeckens & Thissen (1980ff.: I, 652).

[128] Cf. the following Greek transcriptions of proper names: *pꜣ-i.di̯-ẖnmw* as πετεχνουμ(ις) (Lüddeckens & Thissen 1980ff.: I, 339); *pꜣ-i.di̯-ḥr-pꜣ-ẖrd* as πετεαρποχρατ(ης) ~ πετεαρποκρατ(ης) (Lüddeckens & Thissen 1980ff.: I, 328).

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- *ḫb*[129] (name of a town in Upper Egypt) > الكاب *al-Kāb* , not attested in Coptic.
- *ṯḫ* “fat”, a *hapax legomenon* from the late temple texts of Edfu > ^{s}ⲧⲱⲕ, ^{b}ⲑⲱⲕ “fat”.

The Demotic writings of *ḫꜣꜥ* show no trace of a stop; rather ‹ḫ› is written, but very often a synchronically unanalyzable ligature appears in this word. Graeco-Roman hieroglyphic texts always have ‹ḫ›, but alliterations with ‹q› and ‹k› seem to indicate that there was already a stop in pronunciation (Vycichl 1958: 387f. and 1983: 71).
If Edel’s (1980: 24f.) identification of the Neo-Babylonian cuneiform transcription *qa-aḫ-sa-mu-nu* with the Egyptian proper name *ḫꜣꜥ-s.t-imn* is correct, the sound change would already have taken place by the 6th century BC.

3.9 Palatalization of back stops and fricatives

Palatalizations of velar consonants are attested in the history of many languages. This phenomenon can also be observed several times in the long history of Egyptian. I discuss the different palatalizations in chronological order. The first palatalization to be discussed seems to have taken place before the first documents of Egyptian were written. This is one of the few occasions where I include considerations about Afroasiatic etymologies in this book.

3.9.1 Prehistoric palatalization before /i/

Palatal stops such as those represented by ‹ṯ› and ‹ḏ› are not usually reconstructed for Afroasiatic. It has long been assumed that they were the result of palatalization of earlier velars (cf. Rössler 1971: 300-306). The etymological identifications of certain pronominal suffixes indeed suggest that ‹ṯ› could arise from original /k/ before /i/:

	Proto-Semitic reconstruction (the same forms still in Akkadian)	Old Egyptian	Sahidic Coptic
1st sg. stative	/-ku/	‹-k›	(not preserved)
2nd sg. masc.	/-ka/	‹-k›	-ⲕ
2nd sg. fem.	/-ki/	‹-ṯ›	-Ø ~ -ⲉ ~ -ⲧⲉ

Based on other Afroasiatic etymologies, Vycichl (1935-38: 390; 1953b: 376f.; 1958: 382, 404; 1959b: 28f.; 1990: 109, 114, 121-126) suggests that *k* was also palatalized before /u/. Since from a typological perspective palatalization is far less common before /u/ than it is before /i/, we would expect better evidence for this claim to consider it seriously, especially since the evidence of the suffix *-ku* (see above) contradicts this. Vycichl suspects that what we describe as /u/ may sometimes have had a fronted articulation (for details ☞ § 5.5.5). Other scholars assume palatalization only before /i/ (Kammerzell 1991b: 190; Loprieno 1995: 31).

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[129] Reading by Frank Kammerzell; conventionally transcribed *nḫb*.

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3.9.2 Palatalization caused by labials in the Old Kingdom

‹k› and ‹q› are incompatible with ‹p› and ‹w› within an Egyptian root (☞ § 4.11.3). It may thus be expected that these velars developed into palatals in the presence of these (and perhaps other) labials. There are two words containing labials in which ‹k› is indeed attested in a few very archaic texts where ‹ṯ› is normally written:

- *-kw*, normally *-ṯw*, dependent pronoun 2nd pers. sg. masc., cf. the related pronominal suffixes mentioned above.
- *kbw*, normally *ṯbw*, "sandals"

I suggest that palatals in some other Egyptian words which contain a labial may also go back to an original velar where this can only be recognized by etymological considerations, such as:

- *ꜣṯp* "to load, to carry", cf. Semitic √*rkb* "to mount, to ride" (etymology by Schneider 1997: 194)
- *wꜣḏ* "green, yellow", cf. Semitic √*wrq* "green, yellow" (Akkadian *warqu* "green, yellow", Arabic *waraq-* "leaves", Hebrew *jāraq*[130] "to be green, to be yellow") and Berber √*wrγ/q* "green, yellow" (Siwi *awraγ* "green", Kabyle *awṛaγ* "yellow", Tamazight *awraγ* "yellow", Tuareg *tă-rwăq* "yellow color")

This phenomenon has traditionally been subsumed under the palatalization described in § 3.9.1. It was Frank Kammerzell who first distinguished both processes.
The palatal stops which arose by the processes described in the preceding sections could be shifted further to dentals (§ 3.9.7) or be preserved as ϫ /c/ ~ ϭ /c^h/ until the Coptic period. Since Greek had no palatals, the Egyptian palatal stops were varyingly substituted by dentals (τ, ϑ), velars (κ, χ), or by the sibilant (σ) in Greek transcriptions (see Quaegebeur 1973).

3.9.3 Palatalization of /x/ in the Old Kingdom

At approximately the same time, the palatalization /x/ > /ʃ/ which is discussed in detail in § 3.8.2 took place.

3.9.4 Late palatalization of velar plosives

3.9.4.1 General remarks

Velar plosives experienced another palatalization which is evident from Coptic:

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[130] The Hebrew word shows the well-known Northwest-Semitic change of initial *w-* into *j-*. Such a form seems to have been borrowed into Egyptian as *iꜣq.t* "leek" (since MK) > ^{s}ⲏϭⲉ, ^{b}ⲏϫⲓ, ☞ § 3.7.3.

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Egyptian grapheme	Bohairic (before a stressed vowel)	Sahidic	P. Bodmer 6	☞ section ... above
‹k›	ϭ /cʰ/	ϭ /kʲ/	ⲕ	3.7.2
‹q›	ϫ /c/	ϭ /kʲ/	ⲕ	3.7.3
‹g›	ϫ /c/	ϭ /kʲ/	ⲕ	3.7.5

The stops which developed by this palatalization merged with the old palatals ‹ṯ› and ‹ḏ› in Bohairic but were kept distinct from them in Sahidic (☞ §§ 3.3.2 and 3.3.3).

All three Egyptian velars can also be preserved as velars in Coptic (ⲕ, ⲭ). Most Coptic texts write the velars with letters adopted from the Greek alphabet, whereas the letters for palatals are taken from Egyptian: ϭ is ultimately derived from the elementary grapheme 𓎡 ‹k› and ϫ from the group writing grapheme 𓄿𓍑 ‹ḏ(ꜣ)›. However the archaic papyrus Bodmer 6 renders the palatal by ⲕ and the velar by a sign ≥ which is derived from the hieroglyph 𓈎 ‹q› (Kasser 1960: XIX).

3.9.4.2 Date

Loan words from Semitic which were adopted with velar stops during the New Kingdom usually appear with palatals in Coptic (☞ appendix 5). Even some more recent loan words are affected, e.g.:

- Semitic **gamal-* "camel" > ^{s}ϭⲁⲙⲟⲩⲗ /kʲaˈmul/, ^{b}ϫⲁⲙⲟⲩⲗ /caˈmul/ ~ ϭⲁⲙⲟⲩⲗ
- Greek ἄγκυρα "anchor" > ^{s}ϩⲁⲩϭⲁⲗ, ^{b}ⲁⲩϫⲁⲗ[131] (stress position uncertain)
- Greek κεράτιον "fruit of the carob-tree" > ^{s}ϭⲁⲣⲁⲧⲉ (missing in Bohairic)

The transcriptions into Semitic scripts from the 1st millennium BC (as well as earlier) do not show any sign of palatalization. Cf. ^{s}ⲉϭⲱϣ /əˈkʲoʃ/ "Nubian" (< *kꜣš.j*) with /kʲ/ whereas the corresponding toponym *kꜣš* "Nubia" is attested as *ku-si* in Neo-Assyrian cuneiform transcription and as כוש *kûš* in Biblical Hebrew[132] with /k/. The first indications of palatalization are found in Greek transcriptions, cf. the Greek transcriptions κιαμουλ(ι) ~ κιμουλις (but also καμουλ, Preisigke 1922: 173) of the proper name ^{s}ϭⲁⲙⲟⲩⲗ, lit. "camel". Therefore Albright (1946b: 317) is probably right in attributing this palatalization to a time not prior to the 4th century BC.

3.9.4.3 Conditions

Any of the Egyptian graphemes ‹k›, ‹q›, and ‹g› may appear as a palatal or as a velar in Coptic. I have argued in § 3.7 that ‹q› and ‹g› covered two phonemes each, one of which was finally palatalized, the other not.

However the situation seems to be different for ‹k›. Czermak (1931/34: §§ 43, 125, 143) suggests here as well that the Egyptian grapheme ‹k› represented two distinct phonemes, /k/ and /k'/, which later appeared as Coptic ⲕ and ϭ (ϫ) respectively. Most scholars (e.g.

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[131] Westendorf (1965/77: 405), Fecht (1985: 93f.).

[132] Osing (1976a: note 1324 on p. 856f.), Vycichl (1983: 50).

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Worrell 1934: 26-30) do not share Czermak's view but assume that the palatalization of ‹k› was actually a phonemic split, although the conditions are not quite clear. Vycichl (1935-38: 386) suggests that the sound written ‹k› was palatalized only before *a*, but not before *i* and *u* (thus still Vycichl 1990: 113-119 and 192f. where, however, the development before *i* is left out of discussion).[133]

In Coptic sometimes the palatalized and sometimes the non-palatalized variety was generalized to all derivations of a lexeme with different patterns of vocalization. If vowels once played a decisive role for the development of ‹k›, this has thus become obscured in Coptic, and it is difficult to discover conditions for the palatalization of ‹k›. We can only say that palatalization affected roughly half of all instances of ‹k›. There are near-minimal pairs such as the following:

- *kꜣp*[134] "to hide" > ^{s}ⲔⲰⲠ /ˈkop/, ^{b}ⲬⲰⲠ
- *kꜣm* "garden" > ^{s,b}ϬⲰⲘ /ˈkʲom/

- *bik* "falcon" > ^{s}ⲂⲎϬ /ˈβekʲ/, ^{b}ⲂⲎϪ
- (*r*)-*wbꜣ-k* "against you" > ^{s,b}ⲞⲨⲂⲎ-Ⲕ /uˈβek/

I can adduce two possible relics of morphophonological alternations. Together with the fact that even late loans were affected by this palatalization, this makes me believe that there was indeed only one phoneme corresponding to ‹k› in Earlier Egyptian:

- As the plural of ^{s}ϬⲰⲘ "vineyard" < *kꜣm* either a form ^{s}ϬⲞⲞⲘ is used, or the form ϬⲰⲘ can appear as singular and plural alike. But another plural form ⲔⲀⲀⲘ is attested once in an early Sahidic text (Schmidt & MacDermot 1978: 40, line 13). If this writing is to be taken seriously, we can perhaps conclude that the specific vocalization of this plural form favored the retention of ‹k› as a velar. Sahidic ⲁ can go back both to **i* and to **u* (☞ § 5.5), however there is some reason to assume that nominal plural forms were often vocalized with *-u-* (cf. Peust 1995: 74). It would seem plausible that the palatalization was suppressed before a back vowel such as *u*.
- The noun *ky* "another, the other" can be used as an independent noun phrase or as an attribute in Egyptian. In Sahidic both forms are phonologically distinct, ^{s}ϬⲈ being the noun phrase form, ^{s}ⲔⲈ the attributive form. It is probable that ϬⲈ is fully stressed and ⲔⲈ is proclitic. This would indicate that the position of word stress had an influence on the palatalization. It is true that many examples of Ϭ < ‹k› in Coptic are found in the onset of a stressed syllable.

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[133] According to Vycichls view *ka* must be by far the most common case since the combinations *ki* and *ku* would regularly have been lost by the earlier palatalization discussed in § 3.9.1.

[134] The transcription of this word is somewhat doubtful.

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3.9.5 Late palatalization of a velar fricative

The velar fricative ‹ḫ› seems to have been palatalised at approximately the same time as the velar stops. However this palatalization did not affect all Coptic dialects, at least as far as we can judge from the writing (for details and date ☞ § 3.8.4). In those dialects in which the palatalization was active, it affected a clear majority of all instances of ‹ḫ›, but no exact conditions are known. Analogical levelling has probably obscured the picture. Note the following minimal pairs:

- *ḫnd* "to tread" > ^{s}ϩⲱⲛⲧ /ˈhont/, ^{b}ϧⲱⲛⲧ /ˈxont/ "to approach"
- *ḫnd* "to plait" (since NK) > ^{s,b}ϣⲱⲛⲧ /ˈʃont/ (Černý 1976: 246)

- *sḫ.t* "to weave" > ^{s}ⲥⲱϩⲉ /ˈsohə/ (more rarely also ^{s}ⲥⲱϣⲉ), ^{b}ⲥⲱϧⲓ /ˈsoxi/
- *sḫ.t* "field" > ^{s}ⲥⲱϣⲉ /ˈsoʃə/

- *ḫnr* (*ḫl*) "to be hoarse" > ^{s}ϩⲱⲗ /ˈhol/, ^{b}ϧⲱⲗ /ˈxol/
- *ḫnr* (*ḫl*) "to scatter" > ^{s,b}ϣⲱⲗ /ˈʃol/ "to flow"

Again we have some relics of morphophonological alternation:

- *iḫ* "what?" > ^{s,b}ⲁϣ /ˈaʃ/
- *iḫ r-k* "what is to you?; why do you (...)?" > ^{s}ⲁϩⲣⲟ-ⲕ /ahˈrɔk/, ^{b}ⲁϧⲟ-ⲕ (with irregular loss of *-r-*)

- *ḫmnw* "eight", rendered as *ḫa-ma-an* in cuneiform transcription in the New Kingdom (☞ appendix 3) > ^{s}ϣⲙⲟⲩⲛ /ˈʃmun/, ^{b}ϣⲙⲏⲛ
- *ḫmn.t* "eighty" > ^{s}ϩⲙⲉⲛⲉ /hməˈnɛ/, ^{b}ϧⲁⲙⲛⲉ

- *ʿnḫ* "to live" > ^{s,b}ⲱⲛϩ /ˈonh/
- *sʿnḫ* "to cause to live, to nourish" > ^{s}ⲥⲁⲁⲛϣ /ˈsaːnʃ/, ^{b}ϣⲁⲛϣ

- *sḫt* "to weave" > ^{s}ⲥⲱϩⲉ /ˈsohə/ ~ ⲥⲱϣⲉ, ^{b}ⲥⲱϧⲓ
- *sḫt.tj* "weaver" > ^{s}ϣϯⲧ /ˈʃtit/ (< */ˈsʃtit/)

3.9.6 Other cases of palatalization

There are slight indications that Bohairic may have had palatal sonorants (e.g. [nʲ], [mʲ]), ☞ §§ 3.17.3 and 3.17.4.
For the palatalization of the original liquid ‹ꜣ› > /j/ ☞ § 3.14.2.1.
For the palatalization of /s/ > [ʃ] in the Napatan dialect of Egyptian ☞ §3.10.

3.9.7 Palatal fronting

Around the end of the Old Kingdom, ‹ṯ› and ‹ḏ› frequently merged with ‹t› and ‹d›, a process which I call palatal fronting. Many of the palatal stops which originally seem to have developed from velars were again eliminated from the language by this process. The conditions for palatal fronting are unknown. We can say that palatal fronting took place

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more frequently than not; palatals were affected almost throughout when they were the last consonant in a word. As with palatalization, our main problem in determining exact rules lies in the generalization of one stop articulation to all derivations of a lexematic group. Furthermore, no traces of morphophonological alternation seem to be left in Coptic.

Steindorff (1892: 720) considers it possible that ‹ṯ› and ‹ḏ› originally represented two sounds each, one of which later merged with the dentals while the other did not:

> “Es ist nun nicht unwahrscheinlich, dass die Zeichen 𓍿 und 𓆓 ursprünglich je zwei verschiedene Laute zum Ausdruck gebracht haben und dass sich hieraus ihre verschiedene Behandlung im Aegyptischen erklärt; doch ist es auch möglich, dass sich die Spaltung der 𓍿 und 𓆓 aus je einem Laute vollzogen hat.”

The first assumption was accepted by Sethe (1899-1902: I, § 306) and still by Czermak (1931/34: §§ 34, 43) whereas Sethe had abandoned it in the meantime (Sethe 1912).
Vycichl (1935-38: 390) tries to find a phonetic cause and suggests that palatals were fronted before *a* and *u* but preserved before *i*, which indeed seems plausible from a typological point of view. Since the pronominal suffix (2. sg. fem.) -*ṯ*, which is assumed to have developed from **ki* (☞ § 3.9.1), was likewise fronted, this rule had to be modified: “Das gilt natürlich nur für die betonte Silbe von Substantiven mit fester Vokalisation” (Vycichl 1953b: 376). Vycichl seems to have always stuck to his theory (Vycichl 1990: 207, but cf. ibidem p. 120).
Osing (1980b: 946f.) gives the following rule which completely avoids involving the vocalic environment:

> “ḏ > d und ṯ > t immer, sofern ḏ/ṯ letzter starker und nicht zugleich erster Radikal [*footnote:* Ausnahme: bei Reduplikation kann ṯ erhalten bleiben]; ḏ > d außerdem immer vor [*Osing implies: without regard to whether a vowel intervenes or not*] b und h, jedoch nie vor ꜣ, ꜥ, f; außerhalb dieser Bedingungen ḏ > d und ṯ > t anscheinend fakultativ.”

This rule seems to cover most of the observable cases, cf. for instance the following words in -*ḏꜣ* and -*ꜣḏ* respectively:

- *wḏꜣ* (w[V]'ḏiꜣV) “to be safe” > ^{s,b}ⲟⲩϫⲁⲓ /'wcaj/
- *ꜥḏꜣ* ('ꜥaḏꜣV) “guilty” > Old Coptic ⲟϫ
- *wꜣḏ* ('waꜣḏV) “to be green” > ^{s,b}ⲟⲩⲱⲧ /'wot/
- *ꜥꜣḏ* (ꜥ[V]'ꜣVḏV) “end” > ^{b}ⲉⲁⲧ /ə'at/

but: *wḏꜣ* ('wiḏꜣV) “to go away” > ^{s}ⲟⲩⲉⲓⲧⲉ /'witə/

Osing’s rule seems somewhat complicated and unnatural and does not make predictions for all environments. However, I cannot make a better proposal. The alternative proposal by Steindorff should still be considered a serious possibility, although it does not explain why -*ḏ* / -*ṯ* were fronted almost without exception as the last consonant in a word.

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Palatal fronting is reflected in writing in two ways: 1) Fronted palatals are very frequently written as dentals from the Middle Kingdom on. 2) On the other hand, (original) dentals can be written as palatals by hypercorrection. Such hypercorrect writings are comparatively rare in Middle and Late Egyptian but become very frequent in Neo-Middle Egyptian (cf. Jansen-Winkeln 1996: § 59-61).
From the end of the Old Kingdom, the sign 𓍿 ‹ṯ› is attested in an alternative form with a diacritic stroke: 𓎀. The latter is believed (Edel 1955/64: I, § 112; Gardiner 1957: 523) to have been used only for those instances of ‹ṯ› which did not undergo fronting. However the distinction between 𓍿 and 𓎀 is not maintained very consistently throughout the texts; a detailed examination of this problem would be welcome.

Compared with palatalization, palatal fronting is far less attested in languages. Nevertheless, a case of unconditioned palatal fronting is found in modern Egyptian Arabic. The phoneme corresponding to the Arabic letter ج which is derived from Proto-Semitic /g/ is now pronounced /g/ (Cairo and surrounding areas) or /ɟ/ ~ /ʒ/ (parts of the Delta, parts of Middle Egypt, widely also in Upper Egypt as a prestige pronunciation) and frequently realized as /d/ in Upper Egypt where it has merged with original /d/ (د).[135]

3.9.8 Palatals as a product of conflation

In very rare cases, a sequence of two consonants can conflate into a single palatal sound. In the transition from Old to Middle Egyptian, the sequence ‹t› + ‹š› merged to ‹ṯ› in the divine name Seth (☞ § 4.8.3).
The Egyptian syntagm *ḏ(i̯.t)* (> ϯ when in isolation) + *šm* (> ϣⲉ) "to cause to go" develops into the Coptic verb ^{s}ϫⲟ, ^{b}ϭⲟ "to send". It is noteworthy that Bohairic chooses the aspirate palatal stop in preference to the non-aspirate one.
The syntagm *ḏ(i̯.t)* + *ḫpr* "to cause to become" develops into ^{s}ϫⲡⲟ, ^{b}ϫⲫⲟ (but ^{a}ⲧϩⲡⲟ) "to produce".
In addition to these regular examples of merger, the sequence ⲧ + ϣ is sometimes replaced by ϫ in certain non-standard Coptic texts, and we also encounter converse writings ⲧϣ for expected ϫ (cf. Crum 1939: 745; Kahle 1954: I, 132, 146).

3.10 Sibilants

We leave aside Egyptian /ʃ/ ‹š› here which has arisen from /x/ by palatalization, ☞ § 3.9.3.

Egyptian has two elementary graphemes for rendering sibilants. There are somewhat confusing usages for transcribing them. Some scholars render 𓋴 as ‹ś› and 𓊃 as ‹s›, others

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[135] Behnstedt & Woidich (1985ff.: I, 70 and II, maps nos. 10-15). ☞ also note in § 3.3.8.1.

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render 𓋴 as ‹s› and 𓊃 as ‹z› (☞ § 2.6.2). I have adopted the latter usage in this book. The signs ‹s› and ‹z› become allographs in Egyptian texts from the Middle Kingdom on, their choice primarily depending on calligraphic considerations. In Coptic, both of them are represented uniformly as ⲥ /s/. As Hommel (1892) first recognized, the choice of ‹s› or ‹z› is, however, very consistent for a given lexeme in Old Egyptian, which caused him to conclude that both signs must have noted two different sounds at that stage.

Due to the early date of their phonetic merger, namely at a time from which no transcription of an Egyptian word into any other writing system is known, it is very difficult to determine what the difference between ‹s› and ‹z› was. I will not make a decision on this issue but will merely cite the assumptions that have been advanced to date:

- Hommel (1892: 9) suggests that 𓋴 etymologically corresponds to Hebrew ש and 𓊃 to Hebrew ס. This is represented in the transcription symbols ‹ś› and ‹s›.
- Based on alternative etymologies, Dyroff (1910: note 2 on p. 30) (cf. Sethe 1912: 98) suggests that 𓋴 was voiceless and 𓊃 was voiced. This has become probably the most wide-spread opinion on the topic and is reflected in the transcription symbols ‹s› versus ‹z›.
- Callender (1975: 8f.) describes 𓋴 as an aspirate and 𓊃 as a non-aspirate continuant. This exotic interpretation has not been adopted by any subsequent scholar.
- Based on the rules of compatibility restriction (☞ § 4.11), Baer (1985) argues in an unpublished paper that ‹z› was originally a stop or an affricate rather than a spirant. His arguments are confirmed by Schenkel (1986: 70f.) who assumes that 𓊃 is an affricate as opposed to the fricative 𓋴.
- Kammerzell (1995: xliv, xlvi, xlix and 1998a: 37f.) suggests that 𓋴 was a palatal and 𓊃 a dental fricative and that 𓊃 ultimately is a development from /t/. In his view, the merger of both sibilant phonemes into /s/ at the end of the Old Kingdom is a consequence of the palatalization of /x/ (=‹š›) to /š/ which seems to have happened only a little earlier (☞ § 3.8.2).
- Loprieno (1995: 34) suggests that 𓋴 is a voiceless palatal and 𓊃 a voiced ejective dental fricative.

In the Napatan dialect of Egyptian (☞ § 2.3.), ‹s› and ‹š› frequently interchange in writing. This interchange is only attested where, judging from the evidence of Coptic, a stressed front vowel followed, sometimes also where an unstressed (front?) vowel followed. I assume that /s/ was palatalized in this environment and merged with /ʃ/, so ‹s› and ‹ʃ› could be written without distinction here. This is discussed in detail in Peust (1999). Examples:

- Egyptian *sbj* "enemy" (ˈsubjV) > Old Coptic ⲥⲏⲃ /ˈseβ/ (Westendorf 1965/77: 536), but Napatan *sbj* ~ *šbj*, possibly pronounced [ˈʃeβ].
- Egyptian *šm* > *šj* "to go" > ^{s,b,a}ϣⲉ /ˈʃɛ/, but Napatan *sj* ~ *šj*, possibly pronounced [ˈʃɛ].
- Egyptian *mšʿ* (ˈmašʕV) "to walk" > ^{s}ⲙⲟⲟϣⲉ /ˈmɔːʃə/, ^{b}ⲙⲟϣⲓ /ˈmɔʃi/, (> *ˈmašḥV) > ^{a}ⲙⲁⲁϩⲉ /ˈmaːhə/, but Napatan *mšʿ* ~ *msḥ* (on the devoicing ʿ > *ḥ* ☞ § 3.6.4.3).

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3.11 Liquids

3.11.1 Overview

I assume that Earlier Egyptian had three liquid phonemes – whose exact phonetic nature is difficult to determine – rendered by two graphemes. Most instances of the phoneme written as ‹ꜣ› merged with /j/ after the Middle Kingdom (☞ § 3.14.2.1), and it thus lost its liquid character. The remaining two phonemes were retained as /r/ and /l/ until Coptic, but /r/ often developed into /l/ in the Fayyumic dialect of Coptic under still unknown conditions. Furthermore, in a minority of words ‹ꜣ› was not palatalized but preserved as /r/ or /l/ in Coptic.

For the slight possibility that Late Egyptian additionally had velarized /r^w/ and /l^w/ ☞ § 5.6.4.3.

The principal developments of Egyptian liquids can be summarized as follows:

liquid no.	Old and Middle Egyptian	Late Egyptian	Demotic	Coptic (other than Fayyumic)
1)	‹ꜣ› = /r$_1$/	–	–	–
2)	‹r› = /r$_2$/	‹r› = /r/	‹r› = /r/	ρ = /r/
3)	‹r› = /l/	‹r› ~ ‹nr› ~ ‹n› = /l/	‹r› ~ ‹l› = /l/	λ = /l/

3.11.2 The liquid character of ‹ꜣ›

Since the sound written ‹ꜣ› had already merged with ‹j› by the New Kingdom and was completely lost in Coptic in most positions (☞ § 3.14.2.1), early Egyptologists had a hard time interpreting it. Based on pure guesswork, it was provisionally assigned the sound value /ʔ/ (cf. Steindorff 1892: 725f., Czermak 1931/34: 104-108). An unspecific transliteration symbol ‹ꜣ› was invented which is somewhat reminiscent of ‹ʾ›, the Semitistic transliteration symbol for the glottal stop /ʔ/. Subsequently, a few etymological connections with Semitic languages were found which seemed to support this interpretation (cf. Osing 1997); however, contradicting etymologies can also be found (☞ below).

An etymological relationship between ‹ꜣ› and Semitic /r/ was already suspected by Erman (1892: 123, 126f.). However, even if accepted, this fact alone would not prove that ‹ꜣ› still had the value /r/ in historical Egyptian. When Egyptian transcriptions of Semitic names from a time as early as the Middle Kingdom were discovered, better founded insights into the value of ‹ꜣ› became possible. It can be clearly seen here that both ‹r› and ‹ꜣ› can render both Semitic /r/ and /l/ alike (e.g. *ꜣwšꜣmm* "Jerusalem", Sethe 1926: 53), whereas ‹ꜣ› never corresponds to a Semitic glottal stop. This shows clearly that ‹ꜣ›, like ‹r›, was indeed some kind of liquid at least by the time of the Middle Kingdom. It took, however, several decades until the first scholars actually pronounced this evident conclusion (first Loret 1945 still with weak arguments; more convincingly Hodge 1966: 43-47).

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At present there are basically two opinions on the Pre-Late Egyptian values of ‹r› and ‹ꜣ›:

1) The traditional view holds that ‹r› is a liquid (usually assumed to be /r/) and ‹ꜣ› a glottal stop /ʔ/ (e.g. Vergote 1945: 76, 109-114 and 1973/83: Ib, § 26; Edel 1955/64: I, § 131; Osing 1997)
2) The more recent view holds that both ‹r› and ‹ꜣ› are liquids:
‹r› = /r/, ‹ꜣ› = /l/ (Loret 1945)
‹r› = /r/, ‹ꜣ› = /l/ or /ɾ/ (Hodge 1977: 932-934, 1991b: 383, and 1992)
‹r› = /l/, ‹ꜣ› = /r/ (Schenkel 1990: 34, 36, 44)
‹r› = /l/, ‹ꜣ› = /r/ ~ /ʀ/ (Kammerzell 1995: XLVII, XLIX)
‹r› = /ɾ/, ‹ꜣ› = /ʀ/ (Loprieno 1995: 33).

Satzinger (1994a: 202-205) occupies an intermediate position. Accepting that ‹ꜣ› etymologically corresponds to /r/ or /l/, he assumes that in some dialects of Egyptian this sound value was preserved until a comparatively late period, but that in other dialects the liquid had already shifted to /ʔ/ by the time of the invention of writing.

In Afroasiatic etymological cognates, ‹r› seems easier to relate to Semitic /l/ than to /r/, whereas for ‹ꜣ› both correspondences seem to be frequent (Rössler 1971: 314, Schneider 1997: 193). On the other hand, ‹ꜣ› is comparatively rare in word anlaut (☞ appendix 1 and see Kammerzell 1998a: 33), which is a typologically well-known characteristic of /r/ (word-initial *r*- in unknown or restricted to loan words e.g. in Ancient Greek, Armenian, Basque, Mongolian, and Turkish). For this reason, I prefer Schenkel's/ Kammerzell's solution, although this does not imply a judgement about the exact phonetic realization.

3.11.3 The opposition of /r_2/ and /l/

Earlier ‹r› corresponds to ⲣ /r/ in most Coptic words, but in quite a number of cases it appears as ⲗ /l/. Since no phonetic condition for a split development is evident, I suggest that the grapheme ‹r› represented two distinct phonemes /r_2/ and /l/ in Earlier Egyptian, as long as no better explanation is proposed.[136] Consider the following minimal pairs (all these Egyptian words are attested since OK or MK):

‹r› = /r_2/	‹r› = /l/
‹r› “mouth” > ^{s}ⲣⲟ, ^{f}ⲗⲁ	‹rwi› “to go away” > ^{s}ⲗⲟ, ^{f}ⲗⲁ
‹ꜥrq› “to swear” > ^{s}ⲱⲣⲕ, ^{f}ⲱⲗⲕ	‹ꜥrq› “to bent” > ^{s}ⲱⲗⲕ
‹ḥr› “(god) Horus” > ^{s}ϩⲱⲣ	‹ꜥr› “to ascend” > ^{s,f}ⲱⲗ
‹ḥri̯› “to be content” > ^{b}ϩⲉⲣⲓ, ^{s}ϩⲣⲣⲉ	‹ḥry.t› “fear” > ^{b}ϩⲉⲗⲓ
‹ptr› “to see” > ^{s}ⲡⲱⲱⲣⲉ	‹wꜥr› “to run” > ^{s,f}ⲟȣⲱⲱⲗⲉ

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136 Vycichl (1990: 111f.) assumes that the words exhibiting the development ‹r› > ⲗ originate from a “Heliopolitan” dialect. Similarly Loprieno (1995: 31).

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One rule is apparent, though, namely that ‹r› is always reflected as Coptic ⲗ in a word which also contains ‹ꜣ›.[137] Examples:

- *ꜣrꞽ* ('ꜣarꞽV) "bandage" (since NK) > ^{l}ⲱⲗ
- *ꞽꜣrw* ('ꞽVꜣVrwV) (*a kind of grass*) (since OK), also written *ꞽꜣnr* in Late Egyptian > ^{b}ⲁⲗⲓ, Old Coptic ⲗⲗⲓ "fenugreek"[138]
- *ꞽꜣrr.t* "grape" (since OK) > ^{s}ⲉⲗⲟⲟⲗⲉ
- *ḫꜣtrw* (ḫVꜣ'tarwV) "ichneumon" (since MK) > ^{b}ϣⲁⲑⲱⲗ[139]
- *šꜣrw* ('šaꜣVrwV) "bundle" (since MK) > ^{s}ϣⲟⲗ
- *ṯꜣrw* (ṯVꜣ'ruwV) *a toponym* (since NK), *zi-lu-u* in New Kingdom time cuneiform transcription > ^{s}ⲥⲉⲗⲏ (Gardiner 1947: II, 202*; Fecht 1958: 118)
- *ḏꜣr.t* (ḏVꜣ'rVtV) "scorpion" (since OK), also written *ḏnryt* in Late Egyptian > ^{b}ϭⲗⲏ

This is most easily explained as a compatibility restriction (on this topic ☞ § 4.11) against ‹ꜣ› /r_1/ and ‹r› /r_2/ within a word, while ‹ꜣ› /r_1/ and ‹r› /l/ can co-occur.

There seem to be two exceptions to this rule:

- *ꜣšr* ('ꜣašrV) "to roast" > ⲱⲣϣ (with metathesis). Perhaps *-r* is a secondary development here, ☞ § 3.13.5.
- *ḏꜣr.t* (ḏ[V]'ꜣVrtV) "fruit of the carob-tree" > ^{s}ϫⲓⲉⲓⲣⲉ, ^{b}ϫⲓⲓⲣⲓ ~ ϫⲓⲛⲓⲣⲓ[140], but cf. also the unidentified plant name ^{s}ϫⲓⲉⲓⲗⲉ (Crum 1939: 766).

3.11.4 Developments in Later Egyptian

/r_1/ (‹ꜣ›) merged with ‹j› /j/ by the New Kingdom (☞ § 3.14.2.1). From this time on, the sign ‹ꜣ› was employed very inconsistently and became interchangeable with ‹j› in many words.

If /r_2/ and /l/ are indeed distinct phonemes in Earlier Egyptian, as I suggest above, we must accept the fact that they were not distinguished in writing. The script of the Late Kingdom still had only one grapheme ‹r› for expressing both /r/ and /l/ in native words, whereas in the specialized sub-system of writing which was employed for borrowed words ("group writing", ☞ § 5.4.2) a distinct grapheme 𓈖𓂋𓏥, which can be transliterated ‹nr›, served to express /l/. This grapheme was applied to native words only occasionally (cf. *ḏꜣr.t* "scorpion" above). Curiously, ‹nr› is never found word-initially. Besides, /l/ occasionally seems to be written as ‹n›.[141]

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[137] This rule is already stated by Osing (1976a: note 755 on p. 676-678): "(...) ist in einer ägypt. Konsonantenfolge -ꜣr- das r auch sonst recht häufig in l übergegangen" and similarly by Satzinger (1994a: 197). I have no examples of ‹r› preceding ‹ꜣ›.

[138] Osing (1976a: note 1063 on p. 814), the Old Coptic form from Osing (1998: I, 106, v).

[139] Perhaps borrowed as חָתוּל "cat" into Hebrew, cf. Vycichl (1983: 258).

[140] For meaning and etymology cf. Aufrère (1983).

[141] Cf. *dnm* "furrow", Dynasty 21, from Semitic √*tlm*, > Coptic ^{s}ⲧⲗⲟⲙ~ⲧⲛⲟⲙ, ^{b}ⲑⲗⲱⲙ. Hoch (1994: no. 564).

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The group-writing element ‹nr› was not taken over into Demotic. Instead a new grapheme ‹l› was created from ‹r› by means of a diacritic stroke.[142]

3.11.5 The so-called lambdacism in Fayyumic

One of the most salient features of the Fayyumic dialect of Coptic is its so-called "lambdacism": In Fayyumic ⲗ /l/ appears in many, but not all cases in which the other Coptic dialects have ⲣ /r/. Thus we have three sets of sound correspondences:[143]

1) ⲣ throughout, e.g. ^{s}ⲣⲏ, ^{f}ⲣⲉ "sun"; ^{s}ⲉⲣⲱⲧⲉ, ^{f}ⲁⲣⲱϯ "milk"
2) ⲗ in Fayyumic, ⲣ in the other dialects, e.g. ^{s}ⲣⲁⲛ, ^{f}ⲗⲉⲛ "name"; ^{s}ϣⲏⲣⲉ, ^{f}ϣⲏⲗⲓ "child"
3) ⲗ throughout, e.g. ^{s}ⲗⲁⲥ, ^{f}ⲗⲉⲥ "tongue"; ^{s}ⲁⲗⲉ, ^{f}ⲁⲗⲏ "to ascend".

Although no phonetic conditions have been proposed to date for the development of these three subsets, I hesitate to assume that they are reflexes of three distinct original liquid phonemes since split developments from a single etymological source can be found:

- The ancient word *pr* "house" is preserved in ^{s}ⲣⲣⲟ, ^{f}ⲉⲣⲣⲁ "king, pharaoh" (< *pr-ꜥꜣ* "great house"; ⲡ- was reinterpreted as a definite article and deglutinated), but also in ^{s}ϫⲉⲛⲉ-ⲡⲱⲣ, ^{f}ϫⲉⲗⲉ-ⲡⲟⲗ "roof (lit.: top of house)". The liquid belongs to class 1) in the former compound but to class 2) in the latter.
- *iri̯.t* "to do" > ^{s}ⲉⲓⲣⲉ, ^{f}ⲓⲗⲓ (= class 2), but *di̯.t iri̯* "to cause to do" > ^{s}ⲧⲣⲉ-, ^{f}ⲧⲣⲉ-(stat. pron.) (= class 1)[144]
- In the archaic Fayyumic *Papyrus Hamb. Bil. I* the verb for "to be strong" (Egyptian *ḏrj*) is written ϫⲗⲁ in the infinitive but ϫⲁⲣ in the stative (see Schenke 1991: 93). In all other Fayyumic texts this morphophonological alternation has been eliminated: They have ⲣ throughout as do the other Coptic dialects.

Throughout the other Coptic dialects, variation of ⲗ and ⲣ is uncommon, the only clear example being ^{s}ϭⲱⲗⲡ, ^{b}ϭⲱⲣⲡ "to uncover", a word of unclear etymology.

The integration of Greek liquids in borrowings into Coptic has not yet been explored systematically. In most cases, at least as far as literary texts are concerned, λ and ρ are retained as in the source language.[145] This seems to be true even of many Fayyumic texts.

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[142] See Clarysse & van der Veken (1983: 142f.). The first examples of Demotic ‹l› are found around 265BC; by the 2nd century BC the use of ‹l› had become quite regular although occasional writings of ‹r› for /l/ can still be found in the Roman period.

[143] Group 2) is the most numerous. A list of words belonging to group 1) is given by Schenke (1991: 92).

[144] This is not true for all Fayyumic texts since some have ⲧⲉ-. The existence of another variety ⲧⲗⲉ- is doubtful; ⲧⲗⲉ- is, however, attested as the status nominalis, cf. Diebner & Kasser (1989: 360).

[145] In ^{s}ϩⲁⲩϭⲁⲗ, ^{b}ⲁⲩϫⲁⲗ, ^{f}ϩⲁⲩϭⲏⲗ "anchor", which is considered an early loan from Greek ἄγκυρα (Westendorf 1965/77: 405; Fecht 1985: 93f.), Greek ρ is irregularly represented as ⲗ.

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I am unable to say whether any Greek liquid could be adopted as liquid no. 2 in the process of borrowing. However, earlier loans frequently rendered liquid no. 2 as the following examples show:

- ^{s}ⲕⲟⲩⲡⲣ, ^{b}ⲭⲟⲩⲡⲉⲣ, ^{f}ⲕⲟⲩⲡⲉⲗ "henna", a wandering word, cf. Hebrew כֹּפֶר, Greek κύπρος ~ κύπρις, modern Nubian *kofárē*.[146]
- ^{s,b}ⲙⲟⲣⲧ, ^{f}ⲙⲁⲁⲗⲧ "beard", attested in the Roman period as *mrt* once each in hieratic (Sauneron 1952: 12, line 13) and in Demotic (Erichsen 1954: 169) script, probably borrowed from a predecessor of modern Berber[147]
- ^{s}ⲥⲓⲣ, ^{f}ⲥⲉⲓⲗ "leaven" from Semitic, cf. Hebrew שְׂאֹר "leaven"
- ^{s}ⲧⲣⲓⲣ, ^{b}ⲑⲣⲓⲣ, ^{f}ⲧⲣⲓⲗ~ⲧⲗⲓⲗ "oven" < Late Egyptian *trr* "oven", from Semitic √*tnr* (☞ appendix 5)
- ^{s}ϣⲃⲏⲣ, ^{b}ϣⲫⲏⲣ, ^{f}ϣⲃⲏⲗ "friend" < Late Egyptian (Dynasty 21) *ḫbr* "associate" from the Semitic root √*ḫbr* "to associate" (Hoch 1994: no. 333)

3.11.6 Exceptional preservation of Earlier Egyptian /r₁/ (‹ꜣ›)

There seem to be several cases in which written ‹ꜣ› of Middle Egyptian corresponds to /l/ or /r/ in later stages of the language. If these etymologies are correct, we have to conclude that Middle Egyptian /r₁/ in some cases escaped being weakened to /j/.

Examples of ‹ꜣ› > ⲗ:

- *ꜣbḫ* "to burn" (MK, rare and uncertain) > ^{s,b}ⲗⲱⲃϣ (Vycichl 1983: 95)
- *ꜣhw* "sorrow" (since MK) > ^{s}ⲗⲉϩ (Černý 1976: 75)
- *wꜣs* "to fall into ruins" (since OK) > ^{s,b}ⲟⲩⲱⲗⲥ "to be bent, to be confounded" (Vycichl 1983: 232)
- *bꜣꜣ* "eyeball" (OK, rare) > Late Egyptian *bnr* > Demotic *bl* > Coptic ⲃⲁⲗ "eye" (Wilson 1997: 321f.)
- *ḥꜣg* "to be happy" (since MK) > Late Egyptian *ḥnrg* > Demotic *ḥlg* > Coptic ^{s}ϩⲗⲟϭ, ^{b}ϩⲗⲟϫ "to be pleasant"
- *ḥꜣ* (exclamation of desire) (since OK) > Late Egyptian *ḥnr*[148] (the writing ‹nr› probably indicating /l/)
- *ḫpꜣ* "navel" (since OK) > ^{s}ϩⲗⲡⲉ, ^{b}ϧⲉⲗⲡⲓ (metathesis has to be assumed)
- *kꜣkꜣ* "blister" (NK) > ^{s}ⲕⲉⲗⲕⲟⲩⲗⲉ "pocks"
- *dꜣgy* "bat" (since MK); in Coptic this word appears in manifold variants such as ^{s}ϭⲓⲛϭⲗⲱ, ^{s}ϭⲱⲗϭⲉⲗⲱ, ^{b}ϫⲉⲗϫⲟⲩ, ^{f}ϭⲉⲣϭⲱ etc.

Examples of ‹ꜣ› > ⲣ:

- *mꜣw* "to be new" (since OK) > Demotic *mꜣy* > ^{f}ⲙⲟⲩⲓ "new"; additionally, from Demotic on we find *bry* > Coptic ^{s}ⲃⲣⲣⲉ, ^{b,f}ⲃⲉⲣⲓ "new". Cf. also Old Nubian ⲙⲓⲣⲓ- *et var.*, modern Nobiin *míríi* "new" (Browne 1996: 118, Werner 1997: 368).

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[146] Vycichl (1983: 84f.). The Nubian form is taken from Khalil (1996: 65).
[147] Behrens (1984/85: 160 and 163), Vycichl (1983: 120).
[148] Wb III, 11f.; cf. Meeks (1997: 41 and 45f.).

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- *ḫ3t* “to rage” (NK) > ^{s}ϣⲱⲣⲧ, ^{b}ϧⲟⲣⲧ (verb in stative form), but also > Demotic *ḫyt* > ^{s}ϣⲟⲉⲓⲧ (adjective)
- *q33* “hill” (since OK) > Demotic *qr* > Coptic ^{s}ⲕⲣⲟ, ^{b}ⲭⲣⲟ “shore” (Vycichl 1983: 85)

Some more possible examples are cited by Satzinger (1994a: 199).

3.11.7 Egyptian ‹n› corresponding to Demotic-Coptic /l/

There are a few words in which older *n* seems to be represented as *l* from Demotic on[149], e.g.:

- *nw.t* “yarn, cord” (since MK) > ^{s,b}ⲗⲁⲩⲟ “sail”
- *nn* (NK) “bed” > ^{b}ⲗⲟⲗ (see Osing 1976a: 171)
- *ns* “tongue” (since OK)[150] > Demotic *ls* > ^{s,b}ⲗⲁⲥ (compare Arabic لِسان *lisān-* “tongue”)
- *nqʿ.wt* “sycamore figs” (since OK) > Demotic *3lqw* > ^{s}ⲉⲗⲕⲱ, ^{b}ⲉⲗⲕⲟⲩ (Osing 1976a: note 930 on p. 765-768)
- *ḥfnn.t* (a reptile) (OK) > Demotic *ḥfll.t* > ^{s}ϩⲁϥⲗⲉⲉⲗⲉ “lizard”

Three alternative explanations are possible:

1) There was a sound change *n* > *l* under unknown conditions.
2) *l* is original in these words and was merely written as ‹n› in the older periods. Several scholars (e.g. Edel 1955/64: I, § 130; Vycichl 1990: 110f.) prefer this assumption because of supposed Afroasiatic etymologies with *l*. This scenario is, however, hard to reconcile with the view that the grapheme ‹r› is the regular means of expressing /l/ (☞ § 3.11.1). For further considerations see Westendorf (1962: §§ 50f.).
3) The correspondence Egyptian *n* – Demotic-Coptic *l* is actually the notation of a third sound different from the primary phonetic correlates of both ‹n› and ‹l› (thus Kammerzell 1995: XLIII f.).

The development *n* > *l* by sonorant shift is discussed in § 3.16.4.

3.11.8 Other exceptional developments

There is slight evidence for an occasional sound change ‹3› > *n*, cf. Osing (1976a: note 964 on p. 777-780).

For similar sound changes as a result of sonorant shift ☞ § 3.16.4.

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[149] On less certain evidence for the development /n/ > /l/ from Pre-Demotic times cf. Osing (1976a: note 884 on p. 732f.).

[150] From the Old Kingdom, I know of writings with the biconsonantal sign ‹ns› only for which theoretically an alternative reading, like ‹rs›, could be postulated. However, from the Middle Kingdom on there are explicit writings containing the monoconsonantal sign ‹n› (see Wb II, 320,12, *Belegstellen*).

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3.12 Labials

3.12.1 Overview

I assume the following inventories of labial phonemes for three stages of the language:

Egyptian	‹p› /pʰ/	‹b› /b/ (> /β/)	‹f› /f/	‹w› /w/	‹m› /m/
Bohairic Coptic	ⲫ /pʰ/ (~ ⲡ)	‹b› /β/ ~ [b]	ϥ /f/	(ⲟ)ⲩ /w/	ⲙ /m/
Sahidic Coptic	ⲡ /p/	‹b› /β/	ϥ /f/	(ⲟ)ⲩ /w/	ⲙ /m/

There are five Egyptian graphemes for labial consonants: ‹f›, ‹b›, ‹p›, ‹m›, and ‹w›. For the latter three, all available evidence points to the sound values /p(ʰ)/ (on the question of aspiration ☞ § 3.2), /m/, and /w/ (see discussion on glides in § 5.9), respectively. The nature of ‹f› and ‹b› is somewhat less clear.

3.12.2 ‹f›

Systematic considerations have led Rössler (1971: 280) to assume that the sound written ‹f› was originally an emphatic bilabial plosive /ṗ/. However, in lexical roots of Earlier Egyptian, ‹f› does not pattern with ‹h› (☞ § 4.11.3) which supports the interpretation of ‹f› as a fricative (Kammerzell 1995: xlviii, 1998a: 38). This latter assumption can also be supported etymologically, cf. Kammerzell (1991b: 190f.).

The regular Coptic equivalent of Egyptian ‹f› is the sound written ϥ, which is one of the specific Coptic signs added to the Greek alphabet. The sign ϥ is ultimately derived from the hieroglyphic monoconsonantal sign 𓆑 ‹f›. ϥ represents a labiodental (☞ § 3.12.5) voiceless fricative /f/ which is how it is regularly rendered in Arabic.

‹f› is rarely employed for rendering Semitic loan words in Late Egyptian,[151] which agrees with its interpretation as /f/ (there was no /f/ in Proto-Semitic).

There is graphical variation ‹p› ~ ‹f› in the verb "to cook" *psi̯* ~ *fsi̯* > ^{s}ⲡⲓⲥⲉ and perhaps in a few more words (cf. Edel 1955/64: I, § 114; Vernus 1987). For a possible explanation cf. Kammerzell (1992: 171f. and 1998a: 37).

3.12.3 ‹p›

At the dental, palatal, and velar places of articulation, there were two voiceless stops each which appear to have been distinguished by the presence or absence of aspiration (☞ § 3.2). The labial set of consonants is defective in this respect, and no contrast of this kind can be found here. Bohairic Coptic shows that the only voiceless labial stop belonged to the aspirate class: It is preserved as an aspirate ⲫ /pʰ/ when directly preceding the stressed vowel within a morpheme, as well as when directly preceding sonorants; in the remaining cases it is written ⲡ /p/, similarly to the other aspirate stops.

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[151] Aside from a few cases where it renders Semitic /p/, see Hoch (1994: 401, 430).

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However, a marginal opposition between aspirate ⲫ /pʰ/ and non-aspirate ⲡ /p/ has begun to develop by Bohairic. First, the stop is written ⲡ even before a stressed vowel if a morpheme boundary intervenes. Thus, virtual phonological contrasts arise such as ⲡ-ⲏⲓ "the house" — ⲫⲏⲓ "leap", or ⲡ-ⲱⲟⲩ "the glory" — ⲫⲱⲟⲩ "theirs". Furthermore, the stop is written ⲡ before the stressed vowel if a consonant once intervened which was lost in Bohairic. I know only two such cases: ^{b}ⲡⲏⲣⲓ /ˈperi/ "quail" < Egyptian *pꜥr.t* (p[V]ˈꜥurtV) and ^{b}ⲉⲡⲏⲡ /əˈpep/ (month name) < Egyptian *ỉpỉp* (ỉ[V]pˈỉupV). This ⲡ can in theory contrast with ⲫ (I can only offer a near-minimal pair ^{b}ⲡⲏⲣⲓ /ˈperi/ "quail" – ^{b}ⲫⲓⲣⲓ /ˈpʰiri/ "to come forth"). Based on these examples, one could posit a phonological contrast ⲡ /p/ — ⲫ /pʰ/ for Bohairic, which would however be of a very marginal nature.[152] If we take Greek loans into consideration, where π and ϕ are usually preserved as in the source language, the contrast will be much more evident.

‹p› is often not tolerated in direct contact with a dental stop and shifts to Coptic ⲃ /β/ or ⲟⲩ /w/, or is lost completely.[153] This sound shift is almost obligatory for ‹p› preceding ⲧ:

- *ꜣpd* "bird" > ^{s}ⲱⲃⲧ /ˈoβt/
- *ꜣṯp* "to load" > ^{s}ⲱⲧⲡ /ˈotp/ but in Bohairic ⲱⲃⲧ /ˈoβt/ with metathesis (attested only once)
- *ptr-s* "look at it!" > Demotic *ts* (*djs*) (presentative particle) (etymology by Shisha-Halevy 1989: 427)
- **sptw.t* > ^{s}ⲥⲧⲱ /ˈsto/ "river bank" (Fecht 1960: note 227 on p. 76)
- *spd.t* "Sirius (star)" > ^{s}(ⲧⲁⲡ)ⲥⲟⲧⲉ /tapˈsɔtə/ *et var.*; σωϑις in Greek transcription (Černý 1976: 192)
- *spdḏ* "to prepare" > ^{s}ⲥⲟⲃⲧⲉ /ˈsɔβtə/, ^{b}ⲥⲟⲃϯ
- *tp-dbn* (place name) > ⲧⲟⲩⲧⲱⲛ /tuˈton/, Τεβτυνις in Greek transcription (Osing 1976a: note 829 on p. 713)

But: *ptḥ* (divine name) > ϕϑα in Greek transcription, ^{s}ⲡⲧⲁϩ /ˈptah/

This sound shift is attested but not obligatory for ‹p› following ⲧ:

- *stp* "to choose" > ^{s}ⲥⲱⲧⲡ /ˈsotp/
- *tp-n-ỉꜣw.t* "animal" > ^{s}ⲧⲃⲛⲏ /tβˈne/

While Greek loan words are left unaffected by this development for the most part (cf. ⲃⲗⲁⲡⲧⲉⲓ "to harm", Böhlig 1954: 47), there is a Bohairic rendering ⲗⲉⲃⲧⲟⲛ for ⲗⲉⲡⲧⲟⲛ (a coin) < λεπτόν (Crum 1939: 27).

We can place this development into a wider context. According to the rules of consonant incompatibilities (☞ § 4.11), ‹p› could not co-occur with ‹k› and ‹q› in Earlier Egyptian. So there were already some restrictions for ‹p› to be part of a cluster of stops within a

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[152] Another solution would be to assume that a reflex of Egyptian ‹ꜣ› and ‹ꜥ› is still present in Bohairic although not expressed in writing. This is Hintze's (1980: 59) solution who interprets ^{b}ⲡⲏⲣⲓ as /pʔeːrə/ and ^{b}ⲉⲡⲏⲡ as /ʔəpʔeːp/. On this ☞ § 3.4.2.

[153] This rule was first formulated by Steindorff (1894: 10), albeit in a somewhat more restricted form.

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morpheme. This tendency is greatly expanded by the Coptic restriction to combine ⲡ with ⲧ, the latter being the primary successor of no less than four Egyptian stops (‹t›, ‹d›, ‹ṯ›, ‹ḏ›).

For rare cases of a development $p > b$ outside this condition see Osing (1976a: note 461 on p. 573) and Ward (1975).

3.12.4 ‹b› in Egyptian

In mutual Egypto-Semitic transcriptions, Egyptian ‹b› corresponds well to Semitic /b/ (cf. Hoch 1994: 401f., 431, 435). In Coptic, its principle representative is ⲃ which seems to render [β], more rarely [b] (☞ below). However, ‹b› regularly develops into ⲡ /p/ in all Coptic dialects if it is the last consonant in a word **and** does not form part of a cluster in the Paleo-Coptic reconstruction:

- *ḥ3b* (ḥ[V]ˈ3abV) "feast" > ^{s,b}ϩⲟⲡ /ˈhɔp/
- *wʿb* (w[V]ˈʿabV) "to be pure" (infinitive) > ^{s}ⲟⲩⲟⲡ /ˈwɔp/

but:

- *h3b* (ˈha3bV) "to send" > ^{s,b}ϩⲱⲃ /ˈhoβ/
- *wʿb.w* (ˈwaʿVbwV) "to be pure" (stative) > ^{s}ⲟⲩⲁⲁⲃ /ˈwa:β/, ^{b}ⲟⲩⲁⲃ

This is probably a case of word-final desonorization. We can assume that at a time subsequent to the Paleo-Coptic stage the final vowels postulated for Paleo-Coptic disappeared after single consonants but were retained after consonant clusters. Any /b/ which happened to be word-final at that stage lost its sonority. When more word-final vowels were dropped later, the desonorization rule was no longer at work:

Paleo-Coptic	subsequent stage	desonorization	Coptic
(ḥ[V]ˈ3abV)	(ḥ[V]ˈ3ab)	(ḥ[V]ˈ3ap)	/ˈhɔp/
(ˈha3bV)	(ˈha3bV)	(ˈha3bV)	/ˈhoβ/

Traces of the sound shift /b/ > /p/ can be found in writing from the New Kingdom on (cf. Ward 1975: 64f.). Apart from these regular cases, there are a few additional examples of a shift ‹b› > ⲡ for which it is difficult to give rules.[154]

The fact that ‹b› could develop into /p/ is a good indication that ‹b› indeed originally noted a stop rather than a fricative as Coptic ⲃ is.

Exceptionally, ‹b› can develop into /w/:

- *sb3* "star" > ^{s,b}ⲥⲓⲟⲩ /ˈsiw/
- *sbkw* (divine name) > σουχος in Greek transcription (Vycichl 1983: 86)

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[154] See Crum (1939: 27), Fecht (1985: note 8 on p. 88), Osing (1976a: note 614 on p. 613f. and note 677 on p. 653), Ward (1975).

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3.12.5 Ⲃ in Coptic

The primary phonetic value of the Coptic letter Ⲃ was [β], a voiced bilabial fricative. In Coptic, Ⲃ patterns together with the sonorants in that it can form a syllable nucleus (☞ § 5.10) and triggers an epenthetic vowel in Akhmimic in words such as ⲞⲨⲒⲈⲒⲂⲈ "priest" < *wˁb* (☞ § 5.8.2).

Bohairic seems to have had the peculiarity that Ⲃ was realized as a stop [b] in word-final position (this affects word-final *b*'s which had not already become /p/ by the desonorization rule discussed in the preceding section). The [b]-pronunciation is suggested by the fact that there is graphical alternation with Ⲡ in this position:

- *ḏbˁ* "seal" > ^{s}ⲦⲰⲰⲂⲈ /ˈtoːβə/, ^{b}ⲦⲰⲂ~ⲦⲰⲠ /ˈtoβ/ [ˈtob]
- *qȝb* "to double" > ^{s}ⲔⲰⲂ /ˈkoβ/, ^{b}ⲔⲰⲂ~ⲔⲰⲠ /ˈkoβ/ [ˈkob]
- *mˁbȝ* "thirty" > ^{s}ⲘⲀⲀⲂ, ^{b}ⲘⲀⲠ (*ⲘⲀⲂ accidently not attested).
- *ḏbˁ* "finger" > ^{s}ⲦⲎⲎⲂⲈ, ^{b}ⲦⲎⲂ (*ⲦⲎⲠ accidently not attested)

I assume that Bohairic [b] is a phonetic archaism: /b/ usually shifted to /β/ but was preserved in Bohairic in word-final position.

In the modern Late Coptic pronunciation, Ⲃ is spoken /w/ in the beginning or middle of a word and /b/ at the end (Sobhy 1915: 17, Vycichl 1990: 31). In borrowings into Arabic, Ⲃ is most commonly rendered as /b/ or as /f/, sometimes also as /w/. (Arabic has /b/, /f/, /w/, but neither /β/ nor /p/; /v/ is absent in Classical Arabic, but some educated speakers use it in European borrowings into Egyptian Arabic.)

However, some records about Late Coptic pronunciation traditions suggest that non-final Ⲃ may have continued to be spoken as /β/ until a comparatively recent time. The Late Coptic transcriptions by Rochemonteix (1892) (on these ☞ appendix 7), though being somewhat imprecise, are quite consistent in indicating a difference between four labial consonants: *b* (= /b/, for Ⲡ, Ⲫ, and word-final Ⲃ), *b'* (probably = /β/, for word-initial and word-internal Ⲃ), *ou* (= /w/, for (Ⲟ)Ⲩ), and *f* (= /f/, for Ϥ).

This seems to be confirmed by Worrell's remarks about what he heard when, together with Vycichl, he recorded the traditional pronunciation of Coptic in the Upper-Egyptian village *iz-Zēnīya* (☞ § 2.2.1) (Worrell & Vycichl 1942: 324f.):

> "The letter Ⲃ is called bēda or vēda [...]. The most common pronunciation is w, instead of which I think I have heard β, though Vycichl thinks not. [...] v undoubtedly occurs, e.g. in ɛkvōk, Ⲕ́ⲂⲰⲔ. Bilabial fricatives are as foreign to Arabic as the dentilabial v. Arabic influence would change β to w and not to v. Though the v remains unexplained, it is more probably derived from β than from w, and β is probably the original sound. [...] The letter Ϥ is called fāj [...], and is pronounced f, not ɸ, though at times I have thought I heard ɸ."

The bilabial nature of Ⲃ seems to be confirmed by a sound rule of Sahidic according to which original ‹f› usually develops into Ⲃ before ⲞⲨ /u/.[155] I suggest that the normally

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[155] I have no example to show how ‹f› developed before consonantal ⲞⲨ /w/.

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labiodental phoneme /f/ was pronounced as a bilabial [ɸ] before the rounded vowel /u/, and this allophone [ɸ] was written with the letter for the bilabial /β/ since both shared the same place of articulation. Although examples for this phenomenon are scarce since /u/ is a somewhat marginal phoneme in Coptic (☞ § 5.3.2), I consider it certain because morphological alternations both in nouns and in verbs can be found:

- The regular plural form of ^{s}ϩⲟϥ /ˈhɔf/ (< *ḥfꜣw*) “snake” is ^{s}ϩⲃⲟⲩⲓ (probably /ˈhfuj/ pronounced as [ˈhɸuj])[156]. However, ^{s}ϩⲟⲃ for the singular and ^{s}ϩϥⲟⲩⲓ for the plural are also encountered as rare by-forms due to analogical confusion.
- When the verb ^{s}ⲱϥⲉ /ˈofə/ “to press” is expanded by the suffix pronoun -ⲟⲩ /u/ “them”, the result is ^{s}ⲟⲃⲟⲩ (/ˈɔfu/ = [ˈɔɸu]) “to press them” (attested in Drescher 1970: 110, line 13).

In addition to the development just described, the graphical opposition between ⲃ and ϥ is neutralized to a considerable degree in many Coptic texts, especially Fayyumic and non-literary Sahidic.[157] A detailed investigation into this phenomenon would be desirable.

3.13 Early consonant losses and related phenomena affecting ‹ꜣ›, ‹j›, ‹w›, and ‹r›

3.13.1 General remarks

Within the history of the Egyptian language, consonants were often lost completely. However this may be difficult to determine based on the Egyptian writings. On the one hand, the non-representation of consonants in writing is a legitimate phenomenon of the Egyptian scripts and need not necessarily indicate its loss in the spoken language (“defective writing”, ☞ § 2.6.4). On the other hand, historical orthography can easily hide a loss that has actually taken place on the phonological level. If a phoneme was lost in Egyptian, this did not typically lead to the simple omission of the corresponding phonogram in writing. Rather, the phonogram was retained although it no longer had a clear phonetic correlate, and its use may in fact have been extended. The various possible relations between phonemes and graphemes make this topic difficult to analyse for the earlier periods from which no transcriptions of Egyptian into other writing systems are extant.

3.13.2 The orthographic shift ‹i› > ‹w› in word-final position

Old Egyptian has numerous words terminating in *-i*. Most of these words underwent graphic changes by the time of Middle Egyptian so that word-final *i* became rare then. In

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[156] Not /-wi/, see Osing (1976a: note 159 on p. 487-490).

[157] See e.g. Crum & Winlock (1926: 242), Kahle (1954: I, 93f. and 136f.), Kasser (1989: 76-78).

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a number of cases, word-final *-ỉ* shifted to the newly fashioned letter *-ï* (☞ § 2.6.3), which should probably be regarded as a mere graphical change. In other cases, *-ỉ* shifted to *-w* which at first glance looks like a sound change and is interpreted as such e.g. by Edel (1959). To take an example, the Old Egyptian adjectival derivative suffix *-ỉ* shifts to *-ï*, whereas the suffix of the stative *-ỉ* shifts to *-w*. In the cases in which the graphical shift *-ỉ* > *-w* takes place, there is no trace of a consonant left in the later transcriptions of Egyptian into other writing systems or in Coptic.[158] For this reason I suggest that there was not really a sound change /j/ > /w/ but that both *ỉ* and *w* were lost in certain environments so that both graphemes became functionally exchangeable in these positions. To take an example, the 3rd pers. sg. masc. stative form *ḥbs.ỉ* "(he) is covered" ('ḥabVsỉV) is generally written *ḥbs.w* from the Middle Kingdom on. I assume that the form had not changed into */'ḥabVswV/ (or similarly) but was simply pronounced /'ḥabVsV/ at that stage, the writing *-w* appearing only due to the fact that earlier spoken *-w* was regularly lost in the same position. The Coptic equivalent is ^{s,b}ϩⲟⲃⲥ /'hɔβs/.
I am unable to explain why Old Egyptian *-ỉ* could appear both as *-ï* and as *-w* in Middle Egyptian.

Word-final ‹ỉ› was retained in Middle Egyptian writing in two cases only:

- The biconsonantal sign 𓍘 ‹tỉ› (also written with additional phonetic complement ‹ỉ› as 𓇋𓍘) was sometimes preserved as such in Middle Egyptian, which certainly is a mere graphical phenomenon. The result was a virtual morphophonological variation in the personal endings of the Middle Egyptian stative *-kw*, *-tỉ*, *-w* as opposed to the "regular" forms *-kỉ*, *-tỉ*, *-ỉ* of Old Egyptian.[159]
  Note, however, that some cases of Old Egyptian *-tỉ* could also be replaced by ‹-tw›, e.g. the passive marker (Old Egyptian) *-tỉ* > (Middle Egyptian) *-tw*.
- If ‹ỉ› directly followed a stressed vowel, it could not be replaced by ‹w›. It was obviously preserved in pronunciation here, sometimes even until Coptic: *hỉ* "husband" > ^{s}ϩⲁⲓ, **mỉ* (usually written *ỉm*, graphical metathesis?) "give! (imperative)" > ^{b}ⲙⲟⲓ.

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[158] 1) The 3rd person masculine of the stative conjugation has a suffix Old Egyptian ‹Ø› ~ ‹ỉ› > Middle Egyptian ‹Ø› ~ ‹w› in the singular, and Old Egyptian ‹w(ỉ)› > Middle Egyptian ‹w› in the plural (cf. Allen 1984: 385f. and Kammerzell 1990: 187). The difference in number is neutralized from Late Egyptian on. While most statives have no suffix at all in Coptic (and may be derived from the old singular form), a few verbs have -(ⲟ)ⲩ /w/ (e.g. ^{s}ϩⲏⲩ /'hew/ from ^{s}ϩⲉ /'hɛ/ "to fall"). If my reasoning is true, -/w/ must reflect the original plural ending in these verbs.
2) In the New Kingdom, a new suffix pronoun of the 3rd person plural *-w* appears which survives as -(ⲟ)ⲩ in Coptic. There are two proposals for its etymology: Vycichl (1953a: 387 and 1994: 249f.) connects it to the nominal plural ending *-w*, whereas Edel (1959) derives it from the Old Egyptian adverbial ending *-ỉ*. If my interpretation of the graphical shift ‹ỉ› > ‹w› is correct, then Edel's etymology would be phonetically impossible.

[159] If my view is correct, it is unneccessary to posit different vocalization patterns to account for the alternation in Middle Egyptian as Kammerzell (1991a: 190f.) does.

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3.13.3 Graphical change ‹w› > ‹y› between stressed vowel and consonant

Schenkel (1962: 47-61) found a rule that ‹w› was usually written ‹y› from the 1st Intermediate Period on in the succession *stressed vowel – ‹w› – consonant.*[160] It is possible to assume that there was indeed a phonetic change /w/ > /j/, but we may also assume that both /w/ and /j/ were lost in this position, which led to an undifferentiated writing ‹y›. The latter hypothesis would account for the fact that, instead of ‹y›, there is frequently no consonant written here at all, unless this is assumed to be a case of defective writing.

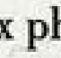
This sound shift seems to have led to morphophonological variation, which is, however, no longer visible in Coptic:

- The infinitive of the frequent verb "to come" is written *ỉw.t* ('iiwtV) in the Old Kingdom but *ỉy.t* (perhaps for 'iitV) from the Middle Kingdom on. Coptic has ^{s}ⲈⲒ /i/, ^{b}Ⲓ.[161]
- In the Ḥeqanakhte letters from the early Middle Kingdom we find the writing *ḥbsy.t* (originally ḥ[V]b'sVwtV, ?> ḥ[V]b'sVtV) "concubine(?)" besides *ḥbsw.t-j* (ḥ[V]b'sVwVtjV or ḥ[V]bs[V]'wVtjV) "my concubine(?)" (example from Schenkel 1997a: 312).
- In a literary text from the Middle Kingdom we find *dp.t* "boat" (originally *d[V]'pVwtV[162], ?> d[V]'pVtV) besides *dpw.t-k* "your boat" (d[V]'pVwVtkV or d[V]p'wVtkV) (example from Schenkel 1997a: 312).
- The noun *kꜣ.t* (which should accordingly be vocalized k[V]'ꜣV[w]tV) "work" renders an adjectival derivation *kꜣw.tï* (k[V]'ꜣVwVtjV or k[V]ꜣ'wVtjV) "worker" (attested since MK) (example from Vycichl 1938).

☞ also § 3.14.2.5.

3.13.4 Variation ‹w› ~ ‹i› in word-initial position

A few words have variant writings *w-* ~ *ỉ-* in word-initial position in Earlier Egyptian, e.g.:

- *ỉt* ~ *wt* "barley" (Edel 1955/64: § 144) > ^{s}ⲈⲒⲰⲦ /'jot/, ^{b}ⲒⲰⲦ
- *ỉꜣḫy* ~ *wꜣḫy* "to be flooded", not preserved in Coptic
- The complex phonogram  seems to have two sound values ‹ip› and ‹wp›.

For further possible examples see Edel (1955/64: I, § 144). The nature of this phenomenon is not clear.

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[160] Schenkel formulates this rule in the framework of the traditional syllable structure rules: ("Intervokalisches w nach dem Tonvokal wird zu j", p. 51). For additional remarks see Schenkel (1979: note 39 on p. 385f.).

[161] Cf. Winand (1991: 377f.) who, however, questions the etymological identity of *ỉw.t* and *ỉy.t*. Cf. further Allen (1984: note 124 on page 521).

[162] This word is accidently not attested with written *-w-* in the Old Kingdom, but note the related noun *dpw* "boat" (Wb V 446f.) of masculine gender.

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3.13.5 Variation ‹r› ~ ‹i›

There is a group of words that show a variation ‹r› ~ ‹i› ~ Ø in Old Egyptian, most frequently in word-final position; the distribution of these writing variants seems so far unpredictable.[163] Some examples are:

- *iwr* ~ *iwi* ~ *iw* "to conceive" > ^{s}ⲱⲱ
- *mrz.t* (form from Roquet 1979: 437) ~ *miz.t* ~ *mz.t* "liver" > Old Coptic ⲙⲁⲟⲩⲥⲉ
- *zwr* ~ *zwi* ~ *zw* "to drink" > ^{s,b}ⲥⲱ
- *zr.t* ~ *zi.t* "sheep" > Old Coptic ⲥⲣⲟ, in Greek transcription σρω[164]
- *dšr* ~ *dš* "to be red" > ^{s}ⲧⲱⲣϣ, ^{b}ⲑⲱⲣϣ (with metathesis) (Allen 1984: 615)
- The Old Egyptian verb *dꜣ* "to control, to subdue" (Allen 1984: 566) is written *dꜣr* ~ *dꜣir* ~ *dꜣi* from the Middle Kingdom on from which time it is frequently confused in writing with *dr* "to remove" (Allen 1984: 547). The Coptic ^{s,b}ϯ /ˈti/ "to fight" is possibly related (Westendorf 1965/77: 219).

Middle Egyptian frequently has a contaminated writing -‹ri› which probably indicates that the alternation had been eliminated one way or another. We do not know what the spoken language had at this stage. The most common opinion holds that ‹r› represents the more ancient state and ‹i› was added later in writing to indicate the newly developed sound value (first Sethe 1899-1902: I, § 241; accepted e.g. by Edel 1955/66: I, § 128, Gardiner 1957: § 279 and end of § 20, Hodge 1977: 932, Kammerzell 1995: L, Westendorf 1962: § 49). However this view is hard to reconcile with Coptic forms in which *-r* is preserved (ⲥⲣⲟ, ⲧⲱⲣϣ). The loss of *r* in ⲥⲱ, ⲱⲱ, etc. might be of a later date. Müller (1909) adduces Afroasiatic etymologies to show that *i* is original in these words. His argumentation is not compelling, either.

Consider the fact that in the well-known root *bnr* ~ *bni* ~ *bn* "to be sweet" the first variety does not conform to the rules of root compatibility for Earlier Egyptian (☞ § 4.11). This indicates that *r* cannot be original at least in this word; *r* is either a later development or a hypercorrect writing. This root was studied by Schenkel (1965) who states that the first writings as *bnr* appear as late as Dynasty 12 (cf. further Vycichl 1990: 59f., 217 on a possible etymological connection of this root to Berber).

3.13.6 Early loss of ‹ꜣ›?

For a possible early loss of ‹ꜣ› ☞ § 4.8.7.

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[163] On this phenomenon in general see Edel (1955/1964: I, § 128), Roquet (1979: 444-454), Allen (1984: 29).

[164] See Vycichl (1983: 195). On this word cf. also Behrens (1984/85: 167).

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3.14 Consonant losses by the time of Coptic

3.14.1 General remarks

As was explained in § 3.13.1, consonantal losses are often difficult to detect based on the Egyptian writing alone. The most trustworthy sources for consonantal loss are representations in foreign writing systems, including Coptic. In this section, I give a summary description indicating which Egyptian consonants were lost by the time of Coptic without discussing the exact chronological order of the particular sound developments. It is quite probable that the individual losses took place at different stages of the language.

We observe that in the cuneiform attestations from the time of the New Kingdom, i.e. by the 14th and 13th centuries BC, many consonants of the older language had already been lost although they were still written frequently (though no longer regularly) in contemporary Egyptian texts. The consonants are likewise missing in the Coptic equivalents of these words. Some examples:

lost consonant	word in older Egyptian writing	word in cuneiform transcription	word in Sahidic Coptic
‹ï›	*pḥ.tï* "might"	*(mi-in-)pa-aḫ-ta(-re-a)*[165]	Old Coptic ⲡⲁϩⲧⲉ
‹y›	*mḥy.t* "north wind"	*(ni-im-)ma-ḫe-e*[166]	^{l}ⲙϩⲏ
‹ꜣ›	*ḥꜣ.t* "front"	*(pa-re-a-ma-)ḫu-ú*[167]	^{s,b}ϩⲏ
‹w›	*i͗(w)nw* "Heliopolis (city)"	*a-na*[168]	^{s,b}ⲱⲛ
‹r›	*nṯr* "good"	*(pa-ḫa-am-)na-ta* ~ *(pa-ḫa-)na-te*[169]	^{s}ⲛⲟⲩⲧⲉ, ^{b}ⲛⲟⲩϯ
‹t›	*i͗p.t* "Luxor"	*(a-ma-an-)ap-pa* ~ *(a-ma-an-)ap-pí*[170]	in the month name ^{s}(ⲡⲁ)ⲟⲡⲉ, ^{b}(ⲡⲁ)ⲱⲡⲓ

Judging from evidence like this, it seems an appropriate generalization that most consonants that are found lost in Coptic were already absent in Egyptian at the time of the New Kingdom. However, the limited number of early transcriptions does not allow us to establish the rules in detail. Due to the graphical problems indicated, it is difficult to determine how long before the New Kingdom the losses took place. It will suffice to mention that, e.g. as far as the date of the loss of the phonological equivalent of ‹t› is concerned, opinions vary from the New Kingdom (CZERMAK 1931/34: 202) to the time of the invention of hieroglyphs (LACAU 1970b: 63).

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[165] ALBRIGHT (1946a: 16).

[166] EDEL (1954: 32)

[167] EDEL (1980: 20-22).

[168] EDEL (1994a: II, 371).

[169] ALBRIGHT (1946: 17f.).

[170] ALBRIGHT (1946a: 9).

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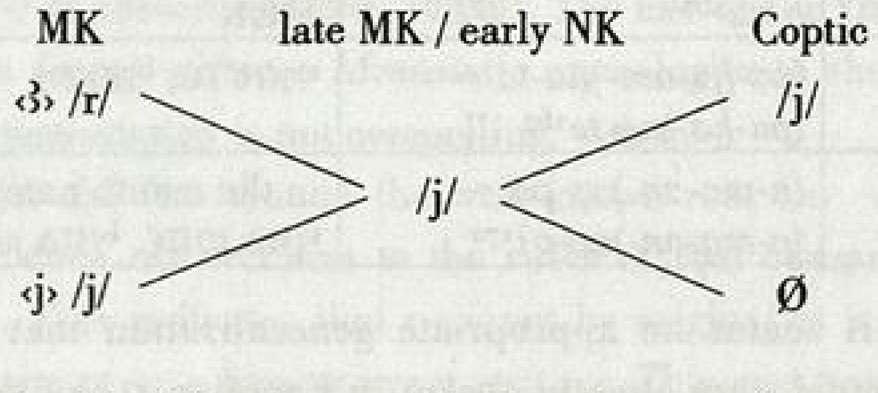
Some scholars assume that the consonants were not lost immediately but rather passed through an intermediate glottalic articulation, or even that they were never lost but were always retained as glottalic sounds which however failed to be written in Egyptian, Coptic, or in any other writing system into which Egyptian was transcribed (thus e.g. OSING 1980b: 947; LOPRIENO 1995: 38, 44-46, 49f. and note 38 on p. 247). On this ☞ §§ 3.4.2 and 5.2.3.1.

Unless indicated differently, all Egyptian words mentioned in the following sections are attested from the Old Kingdom on.

3.14.2 Loss of the glides ‹ꜣ›, ‹j›, and ‹w›

3.14.2.1 General remarks

I assume that the original sound value of all three ‹j›-signs (‹i›, ‹y›, ‹ï›) was /j/ (☞ § 2.6.3.2). All of these consonants are preserved as /j/ or lost under apparently identical conditions. Furthermore, ‹ꜣ› is reflected in Coptic exactly as ‹j› is. This suggests that ‹ꜣ›, originally a liquid /r/ (☞ § 3.11.2), had completely conflated with ‹j› by the New Kingdom at the latest (cf. WESTENDORF 1962: § 22). Therefore ‹j› and ‹ꜣ› will usually be treated together in the following sections. The conditions for the preservation of ‹j›/ ‹ꜣ› as /j/ in Coptic are similar (although not identical) to the conditions under which ‹w› was preserved as /w/.



From the New Kingdom on, ‹j›, ‹ꜣ› and ‹w› are frequently either omitted in writing or else written where they are unexpected etymologically (this is not true for ‹j›, ‹ꜣ›, ‹w› in word-initial position). This not only affects the monoconsonantal signs ‹ꜣ›, ‹i›, ‹y›, ‹ï›, and ~ ‹w›, but also complex phonograms. Signs such as ‹tj›, ‹rw›, ‹pꜣ› and ‹wꜣḏ› change their sound values and can be simply emloyed as ‹t›, ‹r›, ‹p›, and ‹wḏ› (but not ‹ḏ›!) respectively from the New Kingdom on.

To a much lesser degree, some of these effects can be observed as early as in the Old Kingdom (EDEL 1955/64: I, §§ 43-45).

The fact that ‹j›/ ‹ꜣ› could be lost or preserved depending on their position has led to morphophonological alternations in a few Coptic words:

- *ym* "sea" (since NK), a borrowing from Semitic **yamm-* (HOCH 1994: no. 52) > ^{b}ⲉⲓⲟⲙ /'jɔm/ (*j* precedes stressed vowel), but *ym.jw* "seas (plural)" > ^{b}ⲁⲙⲁⲓⲟⲩ /a'maju/ (*j* precedes unstressed vowel)

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- *mi* (?) “give! (imperative)” > ^{b}ⲙⲟⲓ, but in proclitic position ^{s,b}ⲙⲁ- (on the proclitic nature of Sahidic ⲙⲁ- cf. Polotsky 1950: 76-79)
- *nhï-n* “some” (since NK)> ^{s}ϩⲟⲉⲓⲛⲉ /ˈhɔjnə/ “some”, but in proclitic position > ^{s}ϩⲉⲛ- /hən/ *pluralic indefinite article*
- *qrj* “to visit” (since NK) > ^{s}ϭⲟⲉⲓⲗⲉ /ˈkʲɔjlə/, but with following suffix pronoun > ^{s}ϭⲁⲗⲱⲱ- /kʲaˈloː/.

We can observe that morphophonological alternation is found only in late words which are first attested in the New Kingdom. The explanation seems to be that morphophonological alternation in more ancient words was eliminated early by analogical levelling.

3.14.2.2 Glide preceding the stressed vowel

Glides which directly precede the stressed vowel are normally preserved in Coptic:

- *ȝbw* (ˈȝubwV) “Elephantine (toponym)” > ^{s}ⲓⲏⲃ /ˈjeβ/
- *ȝḥ.t* (ˈȝaḥtV) “field” > ^{s}ⲉⲓⲱϩⲉ /ˈjohə/, ^{b}ⲓⲟϩⲓ
- *iȝb.tï* (j[V]ˈȝVbVtjV) “east” > ^{s}ⲉⲓ(ⲉ)ⲃⲧ /əˈjβt/ ~ /ˈjβt/, ^{b}(ⲉ)ⲓⲉⲃⲧ
- *ym* “sea” (since New Kingdom, a borrowing from Semitic) > ^{s}ⲉⲓⲟⲙ /ˈjɔm/, ^{b}ⲓⲟⲙ
- *ir.t* (ˈjVrtV) “eye” > ^{l}ⲉⲓⲣⲉ /ˈjirə/
- *itrw* (ˈjatVrwV) “river” > ^{s}ⲉⲓⲟⲟⲣ /ˈjɔr/, ^{b}ⲓⲟⲣ
- *ḏi.t-msi̯-* “to bring to birth” > ^{s}ⲧⲙⲉⲥⲓⲟ /tməsˈjɔ/, ^{b}ⲑⲙⲉⲥⲓⲟ
- *iwn* (iaˈwinV) “color” (since MK) > ^{s}ⲁⲩⲁⲛ /aˈwan/, ^{b}ⲁⲟⲩⲁⲛ
- *wȝḏ* (ˈwaȝḏV) “green, blue” > ^{s,b}ⲟⲩⲱⲧ /ˈwot/
- *wn* (ˈwanV) “to open” > ^{s,b}ⲟⲩⲱⲛ /ˈwon/
- *wn.t* (ˈwintV) “to hurry” > ^{s}ⲟⲩⲉⲓⲛⲉ /ˈwinə/
- *wḥȝ.t* “oasis” > ^{s}ⲟⲩⲁϩⲉ /ˈwahə/, ^{b}ⲟⲩⲁϩ, whence Greek ὄασις, English *oasis*.
- *wḥm* “to repeat” > ^{s}ⲟⲩⲱϩⲙ /ˈwohm̩/, ^{b}ⲟⲩⲱϩⲉⲙ
- *twtw* “image” > ^{s}ⲧⲟⲩⲱⲧ /ˈtwot/, ^{b}ⲑⲟⲩⲱⲧ

But ‹j›/‹ȝ› can also be lost. This concerns the following cases:

1) In most verbs ‹j› / ‹ȝ› is lost even before the stressed vowel:

- *ȝṯp* (ˈȝaṯpV) “to load” > ^{s}ⲱⲧⲡ /ˈotp/, ^{b}ⲱⲃⲧ
- *iw*(*r*) “to get pregnant” > ^{s}ⲱⲱ /ˈoː/
- *ip* “to count” > ^{s,b}ⲱⲡ /ˈop/
- *ir.t* “to do” > ^{s}ⲉⲓⲣⲉ /ˈirə/, ^{b}ⲓⲣⲓ

An exception is *iʿ.t* “to wash” > ^{s}ⲉⲓⲱ /ˈjo/, ^{b}ⲓⲱⲓ

The importance of the morphological category suggests that analogical levelling has taken place here. Fecht (1960: XIVf.) provides a plausible explanation that many verbal forms of the suffix conjugation, which was very familiar to the older language before it became almost extinct in Coptic, had suffixal stress. /j/ would thus have been lost regularly here in pretonic position, whence the /j/-less variety was extended by analogy to forms bearing initial stress such as the infinitive.

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2) ‹j› is usually lost before Ⲏ (rule by Vycichl 1940: 87):

- *ỉꜣw.t* (ỉ[V]'ꜣuwtV) "cattle" conserved in ^{s}ⲦⲂⲚ-Ⲏ /tβ'ne/, ^{b}ⲦⲈⲂⲚ-Ⲏ "animal"
- *ỉp.t* ('ỉuptV) "number" > ^{s}ⲎⲠⲈ /'epə/, ^{b}ⲎⲠⲒ
- *ỉrp* ('ỉurpV)"wine" > ^{s,b}ⲎⲢⲠ /'erp/

An exception is *ꜣbw* "Elephantine (name of a town)" > ^{s}ⲒⲎⲂ /'jeβ/. Note also *rmy.t* "tear" (since Middle Kingdom) > ^{s}ⲢⲘⲈⲒⲎ /rm̩'je/ (or /r̩m'je/?, /r̩'mje/?), but ^{b}ⲈⲢⲘⲎ /ər'me/.

3) There are a few more cases for which I cannot offer an explanation,[171] e.g.:

- *ꜣpd* "bird" > ^{s}ⲰⲂⲦ /'oβt/
- *ỉf*[172] "flesh" > ^{s,b}ⲀϤ /'af/
- *ỉnr* "stone" > ^{s}ⲰⲚⲈ /'onə/, ^{b}ⲰⲚⲒ

Note with divergence among the Coptic dialects:

- *ỉꜥḥ* "moon" > ^{s}ⲞⲞϨ /'ɔ:h/, ^{b}ⲒⲞϨ /'jɔh/

‹w› is never lost before the stressed vowel.[173]

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[171] Based on such cases, Kurt Sethe proposed that already in Earlier Egyptian ‹ỉ› had two different sound values /j/ and /ʔ/ which are still distinguished in Coptic stressed syllables. On this ☞ § 2.6.3.2. Sethe's solution fails to take into account the fact that ‹ꜣ› undergoes the same irregular development.

[172] Reading after Frank Kammerzell (conventionally *ỉwf*).

[173] Several examples for the loss of *w* have been cited, but I do not consider them convincing:

  - *ỉ(w)f* "flesh" > ^{s,b}ⲀϤ. While *ỉwf* is the conventional transcription, it seems certain now that the Egyptian word is to be transcribed *ỉf* (Frank Kammerzell, publication being prepared).
  - *ỉ(w)nw* "Heliopolis", *a-na* in cuneiform transcription of the New Kingdom (Edel 1994a: II, 371) > ⲰⲚ. Here the conventional transcription might be questioned as well.
  - *ỉwr.tỉ* (ỉ[V]'wVrVtỉV) "to become pregnant (stative)" > ^{s}ⲈⲈⲦ; the loss of *-w-* is probably by analogy with the infinitive of the same verb: *ỉwr* ('ỉawrV) > ^{s}ⲰⲰ.
  - *wzš.t* "urine" (since MK) > ^{s}ⲒϢ. The semantic correspondence is good but the sound development is difficult in more than one respect (unexpected vowel class, no final -Ⲉ).
  - *rwỉ* "to depart" > ^{s}ⲖⲞ. The vowel class seems to demand that *-w-* preceded the stressed vowel. But in a verb like this, there is a good probability that the sound shape was modified by analogy to other verbal forms. On this verb cf. also § 3.14.2.4.
  - ^{b}ϪⲰⲦ as compared with ^{s}ϪⲞⲨⲰⲦ "twenty". Unfortunately the reading of the Egyptian numeral for "20" is unknown, so we do not know whether or not *-w-* is original in this word.
  - At a time when the subjunctive and the prospective tense had not yet been recognized as different verbal categories (for the recent state of affairs cf. Schenkel 1997a: 185f.), Westendorf (1963) had to postulate that *-w-* disappeared in certain verbal forms when directly preceding the stressed vowel. This assumption is no longer necessary now.

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3.14.2.3 Intervocalic glide following the stressed vowel

A glide is usually retained if it directly follows the stressed vowel and another vowel follows:

- *wḏꜣ* (w[V]'ḏiꜣV) "to be healthy" > ^{s,b}ⲟⲩϫⲁⲓ /u'caj/
- *mr-jḥ.w* (m[V]'ra-juḥwV) "overseer of cattle" > ^{s}ⲉⲗⲟⲓϩ /ə'lɔjh/
- *n-i͗* "to me" > ^{s}ⲛⲁⲓ /'naj/, ^{b}ⲛⲏⲓ
- *hi͗* "husband" > ^{s,b}ϩⲁⲓ /'haj/
- *ḥrw* > *ḥri͗* "above" > ^{s}ϩⲣⲁⲓ /'hraj/, ^{b}ϧⲣⲏⲓ
- *zwnw* > *zjnw* ('zVjVnwV) "physician" > ^{s}ⲥⲁⲉⲓⲛ /'sajn/, ^{b}ⲥⲏⲓⲛⲓ
- *sꜣ* "back" > ^{s,b}ⲥⲟⲓ /'sɔj/
- *sṯi͗* "smell" > ^{s}ⲥⲧⲟⲓ /'stɔj/, ^{b}ⲥⲑⲟⲓ

- *bꜣw* "hill" (b[V]'ꜣawV) (since MK) > ⲃⲟⲟⲩ /'βɔw/[174]
- *fdw* "four" (f[V]'dawV) > ^{s,b}ϥⲧⲟⲟⲩ /'ftɔw/
- *mw* "water" ('mawV) > ^{s}ⲙⲟⲟⲩ /'mɔw/, ^{b}ⲙⲱⲟⲩ
- *nw* "time" > ^{s,b}ⲛⲁⲩ /'naw/
- *ḫrw* "voice" > ^{s}ϩⲣⲟⲟⲩ /'hrɔw/, ^{b}ϧⲣⲱⲟⲩ
- *swḥ.t* ('sawVḥtV) "egg" > ^{s}ⲥⲟⲟⲩϩⲉ /'sɔwhə/, ^{b}ⲥⲱⲟⲩϩⲓ

However, for ‹ꜣ›/ ‹j› there are several cases of loss which remain unexplained:[175]

- *ꜥꜣ* "big" ('ꜥaꜣV) > ^{s,b}-ⲟ /'ɔ/ (in Coptic found in compounds only)
- *mꜣꜥ.t* ('muꜣVꜥtV) "truth" > ^{s}ⲙⲉ /'mɛ/, ^{b}ⲙⲏⲓ /'mei/[176], ^{a}ⲙⲏⲉ /'meə/.
- *sbꜣ* (s[V]'biꜣV) "door" > ^{s,b}ⲥⲃⲉ /'sβɛ/
- *tꜣ* "land" > ^{s}ⲧⲟ /'tɔ/, ^{b}ⲑⲟ
- *tpi͗* "what is above" > ^{s}ⲧⲡⲉ /'tpɛ/

But also ‹w› can be lost after ⲉ (cf. Osing 1976a: notes 90, 92 on p. 411-418):

- *mtrw* (mVt'rVwV) "witness" > ^{s}ⲙⲛⲧⲣⲉ /m̩[n]t'rɛ/, ^{b}ⲙⲉⲑⲣⲉ

Each of the adverbs *ꜥꜣ* ('ꜥVꜣV) and *minꜣ* (m[V]i[V]'nVꜣV), both of which are attested from the early Middle Kingdom on (James 1962: 109-112), can mean "here" as well as "there". Coptic has two successors each so that both functions are phonetically distinguished: ^{s,b}ⲧⲁⲓ "here", ^{b}ⲙⲛⲁⲓ "here", but ^{b}ⲧⲏ "there", ^{b}ⲙⲛⲏ "there" (for ‹ꜥ› > ⲧ ☞ § 3.6.2). It is not clear how this difference developed.

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[174] On this word see Osing (1976a: note 749 on p. 676) and Vycichl (1983: 33). It is preserved in the modern place name فاو *Fāw*, Upper Egypt.

[175] For more examples cf. Osing (1976a: notes 734f. on p. 667-669).

[176] This is the reading suggested by comparison to Akhmimic, although the Bohairic writing alone would equally allow for a monosyllabic interpretation /'mej/ (cf. Osing 1976a: note 102 on p. 439f. and Loprieno 1994: 129).

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3.14.2.4 *Cluster of glides following the stressed vowel*

If a cluster of two glides directly follows the stressed vowel, only one of them is preserved in Coptic. Two different developments are possible for a cluster of two glides one of which is ‹w›. There appears to be no rule to predict which development applied,[177] and the Coptic dialects may show different developments.

1) The first possibility is that Coptic has /w/, no matter whether ‹w› appears in the first or in the second position of the cluster in Egyptian. A good explanation would be that assimilation took place at some stage of the language:[178]

- *ỉrï.w* (j[V]'rujwV) "fellows" (?> j[V]'ruwwV) > ^{s}ⲉⲣⲏⲩ /ə'rew/, ^{b}ⲉⲣⲏⲟⲩ
- *g3w* ('ga3wV) "narrow" (?> 'gawwV) > ^{s}ϭⲱⲟⲩ /'kʲow/

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177 Osing (1976a: 28-30) assumes that the development is conditioned by the quality of vowels which he assumes to have intervened between both glides. His rules can be summarized as follows: 1) if one of the glides was *-w-*, then it was preserved if the intervening vowel was *-a-*, 2) as an exception to this rule, the sequence *-áwaw* renders -ⲟⲩⲓ(ⲉ) ~ -ⲱⲓ in Coptic; 3) if the intervening vowel was *-i-*, then *j* was preserved unless the stressed vowel of the word was *i*; 4) in all remaining cases (including the cases of intervening *-u-*), none of the consonants was preserved. Schenkel (1979) discusses Osing's rules in detail and proposes some modifications (Schenkel 1979: 389). However, evidence for determining these intermediate vowels is weak; according to our reconstruction there were no such vowels at all.

178 It should be noted that the frequent development of *-3w* and *-jw* > -(ⲟ)ⲩ is hard to explain according to the traditional syllable structure rules. It is difficult to see here why word-final *-3Vw* or *-jVw* was preserved as -ⲟⲩ whereas word-final *-Vw* was generally lost.
Sethe (1899-1902: I, § 161a) assumes that first the segments *-3V-* / *-jV-* were lost and then *w* came to directly follow the stressed vowel where it was regularly preserved. This, however, would be hard to reconcile with the relative chronology since 1) the loss of *-3V-* implies that ‹3› had already merged with ‹j› which must have been after the Middle Kingdom (☞ § 3.11.2), and 2) the loss of *w* in unstressed word-final syllables already seems to have taken place between the Old and the Middle Kingdoms (☞ § 3.13.2).
Osing (1980b: 947) states the somewhat counterintuitive rule that there was a "Schwund von Alef, j, w im Auslaut einer Nachtonsilbe, sofern diese nicht auch mit Alef, j, w anlautet".
In an attempt to explain the plural form ⲣⲱⲟⲩ "mouths" < *r3.w*, Vychichl (1955: 264f.) tries another solution in assuming that the Egyptian plural ending was not *-Vw* but *-ū* (as known in Semitic), so it was in direct contact with *3* and could trigger assimilation to *w*. Lambdin (1958: 188) follows his suggestion. However this does not explain the same phenomenon in non-plural forms such as ⲧⲏⲩ, ϭⲱⲟⲩ, and ϯⲟⲩ.
Vergote (1969: 89) suggests that ⲣⲱⲟⲩ goes back to **ra3ūwu*, thus placing the stressed vowel directly before *-w*. This form is not in agreement with the syllable structure rules.

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- *gwꜣ* ('gawꜣV) “to push off”[179] (?> 'gawwV) > ^{s}ϭⲱⲟⲩ /'kʲow/, ^{b}ϫⲱⲟⲩⲛ
- *ṯꜣw* ('ṯuꜣwV) “wind” (?> 'ṯuwwV) > ^{s}ⲧⲏⲩ /'tew/, ^{b}ⲑⲏⲟⲩ
- *ṯꜣ.w* ('ṯuꜣwV) “to be taken” (stative) > ^{s}ϫⲏⲩ /'cew/, ^{b}ϭⲏⲟⲩ
- *djw* ('dijwV) “five” > ^{s}ϯⲟⲩ /'tiw/, ^{b}ⲧⲓⲟⲩ

2) Another possibility is that the first consonant survives in Coptic. Thus, if ‹w› is the first consonant, it is preserved:

- *nwꜣ* “to see” ('niwꜣV) (since Middle Kingdom)[180] (?> 'niwV) > ^{s,b}ⲛⲁⲩ /'naw/[181]
- *ḥwꜣ* ('ḥawꜣV) “to be rotten” (?> 'ḥawV) > ^{s}ϩⲟⲟⲩ /'hɔw/, ^{b}ϩⲱⲟⲩ

If ‹ꜣ› is the first consonant, it can be preserved or lost in Coptic, as is true for word-final ‹ꜣ›:

- *ḥkꜣw* (ḥ[V]'kaꜣwV) “magician” (?> ḥ[V]'kaꜣV) > ^{s}ϩⲁⲕⲟ /ha'kɔ/, ^{b}ⲁⲭⲱ
- *ḥfꜣy.w* (ḥ[V]f[V]'ꜣaywV) “snakes” > ^{s,b}ϩⲃⲟⲩⲓ /'hβuj/
- *sbꜣ.w* “disciple” > ^{s,b}ⲥⲃⲟⲩⲓ /'sβuj/
- *zꜣw* ('zaꜣwV) “beam of wood” (since Middle Kingdom) (?> 'zaꜣV) > ^{s,b}ⲥⲟⲓ /'sɔj/
- *zꜣw* ('zVꜣwV) “Sais (town)” > ^{s}ⲥⲁⲓ /'saj/, ^{b}ⲥⲁ /'sa/, attested as *sa-a-a* (probably to be interpreted [*sajə*] or similarly) in Neo-Assyrian cuneiform transcription (see Borger 1996: 20)

It can be noted that in several of these cases the type of the stressed vowel contradicts what is expected from the syllable structure rules. The stressed vowel seems to have followed the second consonant, judging from its vowel type, but it precedes the reflex of the second consonant in Coptic. This can be interpreted as a very early loss of the second component of the cluster which would have taken place before the syllable structure rules were at work (☞ § 4.8.7): ('niwꜣV) > ('niwV) > ⲛⲁⲩ; ('zaꜣwV) > ('zaꜣV) > ⲥⲟⲓ.

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[179] For this word see Osing (1976a: 778).

[180] For reading and early attestations see Osing (1976a: note 200 on p. 503f.) and Habachi (1985: 36, line 6).

[181] There is a transcription of a New Kingdom Egyptian proper name into Akkadian cuneiform from Boğazköy in the following variants: *pa-ri-iḫ-na-PI*, *pa-ri-iḫ-na-a-PI*, *BI-ri-iḫ-na-PI*, *BI-ri-iḫ-na-a-PI*, *PI-ri-iḫ-na-PI* (see Edel 1994a: II, 364). The sign *PI* is usually read *wa* in Boğazköy texts (Rüster & Neu 1989: no. 317), but the last variety of this name proves that a reading *pi* is also possible here. H. Schäfer (mentioned by Ranke 1923: 133f.) identified his supposed reading *pa/iriḫnāwa* with the rare Egyptian name *pꜣ-rḫ-nwꜣ* (lit.: “he who knows to see”), which was accepted by all subsequent scholars (e.g. Albright 1946a: 18; Edel 1948: 16; Vergote 1973/83: Ib, 93). If this be true, then we have an early cuneiform transcription of the infinitive of the verb *nwꜣ* > ^{s}ⲛⲁⲩ “to see”. *na-(a)-wa* is, however, difficult to reconcile with Coptic ^{s}ⲛⲁⲩ (Coptic ⲁ points to older **i* rather than to **a*, ☞ § 5.5). I suggest that the sign *PI* can also be interpreted as *pi* in the renderings of this name. This would yield *pa/i-ri-iḫ-na-(a)-pi* which could be identified with **pꜣ-rḫ-nfr* (“he who knows well”), a name, however, which I have not yet found attested in Egyptian texts.

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3) Some words are attested with both developments which may be distributed over different dialects:

- *šmȝ.w* “aliens” (š[V]'maȝwV) “aliens” (?> š[V]'maȝV) > ^{s}ϣⲙⲙⲟⲉⲓ /ʃm̩'ɔj/, but (?> š[V]'mawwV) > ^{b}ϣⲉⲙⲙⲱⲟⲩ[182]
- *gȝw* ('gaȝwV), the infinitive of the verb “to be narrow”, develops into ^{s}ϭⲱⲟⲩ /'kʲow/, whereas its participle (also to be vocalized as 'gaȝwV) develops into ^{s}ⲕⲟⲩⲓ /'kuj/ “narrow”.[183]

The pluralic adjective *ꜥȝ.w* ('ꜥaȝwV) “great” is preserved as the final component of certain compounds as follows:

- ^{s}ⲣⲣ-ⲱⲟⲩ /r̥'ow/, ^{b}ⲟⲩⲣ-ⲱⲟⲩ /u'row/, ^{a}ⲣⲣ-ⲁⲓ /r̥'aj/, ^{m}ⲉⲣ-ⲟⲩⲓ /ə'ruj/[184] “kings”
- ^{s}ϩⲗⲗ-ⲟⲉⲓ /hl̩'ɔj/, ^{b}ϧⲉⲗⲗ-ⲟⲓ, ^{a}ϩⲗⲗ-ⲁⲓ “old men”
- ^{s}ⲉⲓⲉⲣ-ⲱⲟⲩ /jə'row/, ^{b}ⲓⲁⲣ-ⲱⲟⲩ, ^{a}ⲓⲉⲣ-ⲱⲟⲩ “rivers”

4) We have an irregular development in

- *rwi*[185] “to depart” > ^{s}ⲗⲟ /'lɔ/. It is unclear whether stress was originally on the first syllable ('rawiV) or on the second (r[V]'waiV). The vowel class can be explained in both cases, but the loss of ‹w› is irregular in any case.

5) If the cluster contains only ‹ȝ› or ‹j›, then Coptic has /j/:

- *mȝỉ* ('maȝjV) “lion” > ^{s,b}ⲙⲟⲩⲓ /'muj/
- *ḥȝ.tï-ỉ* (ḥVȝ'tujjV) “my heart” > ^{s}ϩⲧⲏⲓ /'htej/, ^{b}ϩⲑⲏⲓ

The following example is similar, but /j/ is lost in Sahidic:

- *ḏi̯.i* “(he) is given (3rd pers. sg. masc. stative)” > *ḏi̯.w* (‹w› is only graphical, ☞ § 3.13.2): ^{s}ⲧⲟ /'tɔ/, ^{b}ⲧⲟⲓ /'tɔj/, ^{l}ⲧⲟⲓⲉ /'tɔjə/, ^{a}ⲧⲉⲓⲉ /'tɛjə/

3.14.2.5 Preconsonantal glide following the stressed vowel

Glides preceding other glides have been discussed in the preceding section.

It was discussed in § 3.13.3 that in the succession *stressed vowel – ‹w› – consonant*, ‹w› was usually written ‹y› from the 1st Intermediate Period on. This explains why ‹w› in this position is not usually preserved in Coptic. But ‹j›, including ‹j› < ‹ȝ›, is not preserved in Coptic either. So the general rule is that by the time of Coptic all glides were lost when directly following the stressed vowel and preceding a consonant. It is difficult to say whether the loss of all glides was contemporaneous or not. Some examples:

- *wȝḥ* ('waȝḥV) “to put” > ^{s}ⲟⲩⲱϩ /'woh/, ^{b}ⲟⲩⲟϩ
- *bỉn* ('baỉnV) “bad” > ^{s}ⲃⲱⲱⲛ /'βo:n/, ^{b}ⲃⲱⲛ
- *fȝ.t* ('fiȝtV) “to carry” > ^{s,b}ϥⲓ /'fi/

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[182] But ^{b}-ⲱⲟⲩ may also be a secondary development according to § 5.6.6.3.

[183] See Osing (1976a: note 602 on p. 608f.) and Vycichl (1983: 73). For the divergent developments of ‹g› ☞ § 3.7.6.

[184] The Mesokemic form from Mink (1995: 65).

[185] On this word see Osing (1976a: note 246 on p. 513).

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- *mḥw.t* (m[V]'ḥuwtV) “north wind” (Old Kingdom) > (since Middle Egyptian) *mḥy.t* > ^{l}ⲙϩⲏ /'mhe/ (*or* /m̩'he/)
- *zwr* ('zawrV) “to drink” > **zyr*[186] > ^{s,b}ⲥⲱ /'so/
- *šnḏw.t* (šVn'ḏawtV) “loincloth” (Old Kingdom) > (since Middle Egyptian) *šnḏy.t* > ^{s}ϣⲛⲧⲱ /ʃn̩'to/, ^{b}ϣⲉⲛⲧⲱ. This word is transcribed in an Aramaic text from Elephantine (southern Egypt) as שנטא ‹šnṭʔ› (Couroyer 1954: 559) and also seems to have been borrowed into Greek as σινδών “linen; fine cloth” (cf. Fournet 1989: 73f.).

There are exceptional cases in which ‹w› is retained, probably by analogical levelling:

- *ḥw.t* ('ḥiwtV) “to strike” > ^{s}ϩⲓⲟⲩⲉ, ^{b}ϩⲓⲟⲩⲓ (probably influenced by other verbal forms with a different stress pattern)
- *bw.t* ('buwtV) “abomination” > ^{l}ⲃⲏⲩ. This is probably a nominal derivation (passive participle?) of the verb *bwi̯* “to abominate” (cf. Allen 1984: 569)

3.14.2.6 Glide at a distance from the stressed vowel: pretonic

‹j› / ‹ꜣ› is always lost in pretonic position:

- *ink* (ia'nakV) independent personal pronoun 1st pers. sg. > ^{s,b}ⲁⲛⲟⲕ /a'nɔk/
- *inm* “skin” > ^{b}ⲁⲛⲟⲙ /a'nɔm/
- *ꜣbḏw* “Abydos (a town)” > ^{s}ⲉⲃⲱⲧ /ə'βot/

Exception: If in late compounds a stressed syllable loses stress secondarily, /j/ can move into an atonic syllable: *itrw-ꜥꜣ* “big river” > ^{s}ⲉⲓⲉⲣⲟ /jə'rɔ/, ^{b}ⲓⲁⲣⲟ “Nile”, a compound of 1) *itrw* “river, Nile” > ^{s}ⲉⲓⲟⲟⲣ /'jɔːr/, ^{b}ⲓⲟⲣ “canal” and 2) *ꜥꜣ* “big” > ^{s,b}-ⲟ /'ɔ/.

‹w› can be preserved or lost in pretonic position. The conditions are not clear. Sometimes there is dialectal variation in Coptic. Cf. also § 5.8.4. Examples:

- *wmt* (w[V]'matV) “to be thick” > ^{s,b}ⲟⲩⲙⲟⲧ /'wmɔt/
- *wnw.t* (w[V]'nawtV) “hour” > ^{s,b}ⲟⲩⲛⲟⲩ /'wnu/
- *tꜣ-wnw.t* (tVꜣV-w[V]'nawtV) “this hour = now” > ^{s}ⲧⲉⲛⲟⲩ, ^{b}ϯⲛⲟⲩ
- *wdḥ* (w[V]'tVḥV) “fruit” (late only) > ^{s,b}ⲟⲩⲧⲁϩ, ^{a}ⲉⲧⲁϩ (on this word ☞ also § 5.9.3)
- *r-iwd-* “between” (since NK) > ^{s,b}ⲟⲩⲧⲱ-
- *di̯.t-wḏꜣ-* “to rescue” (with following pronominal suffix) > ^{s}ⲧⲟⲩϫⲟ- /tu'cɔ/, ^{b}ⲧⲟⲩϫⲟ-
- *di̯.t-wꜥb-* “to cleanse” (with following pronominal suffix) > ^{s}ⲧⲃⲃⲟ- /tβ'ɔ/, ^{b}ⲧⲟⲩⲃⲟ- /tu'βɔ/
- *di̯.t-w(n)m-* “to feed” (with following pronominal suffix) > ^{s}ⲧⲙⲙⲟ- /tm̩'ɔ/, ^{b}ⲧⲉⲙⲙⲟ-

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[186] Until the New Kingdom, this verb is never written with a monoconsonantal sign ‹w› or ‹y›; rather a biconsonantal sign ‹wr› is employed which was not abandoned to match the new pronunciation. The writing with ‹wr› is maintained even in Demotic. In Late Period hieroglyphic texts, writings with monoconsonantal signs such as ‹z›-‹i› or ‹z›-‹i›-‹w› are attested, but none with ‹y› (Wilson 1997: 811).

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3.14.2.7 Glide at a distance from the stressed vowel: posttonic

Glides separated from the stressed vowel by another glide are not discussed here but rather in § 3.14.2.4.

If a glide is in posttonic position and has no contact with the stressed vowel, then the syllable structure rules predict that it must always be a component of a consonant cluster.

1) If the glide is the second component of the cluster, it is always lost:

- *pḫꜣ* (ˈpaḫꜣV) "to break" (since MK) > ^{s}ⲡⲱϩ /ˈpoh/, ^{b}ⲫⲱϩ
- *ḥꜣ.tï* (ḥ[V]ˈutjV) "heart" > ^{s,b}ϩⲏⲧ /ˈhet/
- *sn.tï* (ˈsinVtjV) "two (fem.)" > ^{s}ⲥⲛ̄ⲧⲉ /ˈsn̩tə/, ^{b}ⲥⲛⲟⲩϯ

- *ḫnzw* (ˈḫanVzwV) *divine name* > ^{s,b}(ⲡⲁ)ϣⲟⲛⲥ /paˈʃɔns/ (month name)
- *smw* (ˈsimwV) "grass" > ^{s,b}ⲥⲓⲙ /ˈsim/
- *šmw* (ˈšamwV) "summer" > ^{s,b}ϣⲱⲙ /ˈʃom/

Late Egyptian had a suffix pronoun *-w* for the 3rd person plural. According to the regular sound developments, this pronoun should have been preserved only when directly following the stressed vowel or when separated from it by a mere glide, as in

- *n-w* (ˈnVwV) "to them" > ^{s}ⲛⲁⲩ /ˈnaw/, ^{b}ⲛⲱⲟⲩ
- *ḥꜣ.tï-w* (ḥVꜣˈtujwV) "their heart" > ^{s}ϩⲧⲏⲩ /ˈhtew/, ^{b}ϩⲑⲏⲟⲩ

but not in cases like

- *rn-w* (ˈrinwV) "their name".

However the suffix pronoun *-w* was preserved in unstressed position by analogy (^{s}ⲣⲓⲛⲟⲩ "their name" instead of expected *ⲣⲓⲛ).

2) If the glide is the first component of the cluster, then ‹w› is always preserved and ‹j› is frequently so. There is a difference according to whether the preceding consonant was lost by the time of Coptic or not.

If the preceding consonant was lost, the glide comes in direct contact with the stressed vowel. Therefore it preserves its consonantal nature in Coptic, however ‹j› is lost in the Sahidic dialect (on the phonological interpretation of the Bohairic forms ☞ § 5.8.6.4):[187]

- *iri̯.i > iri̯.w* (ˈjarVjjV) "(he) is done (3rd pers. sg. masc. stative)" > ^{s}ⲟ /ˈɔ/, ^{b,l}ⲟⲓ /ˈɔj/, ^{f}ⲁⲓ /ˈaj/
- *mri̯.t* "to love" (ˈmirVjtV) > ^{s}ⲙⲉ /ˈmɛ/, ^{b}ⲙⲉⲓ /ˈmɛj/ (or /ˈmɛi/?), ^{a}ⲙⲉⲓⲉ /ˈmɛjə/ (or /ˈmɛ:jə/?)
- *hꜣi̯.t* (ˈhiꜣVjtV) "to fall" > ^{s}ϩⲉ /ˈhɛ/, ^{b}ϩⲉⲓ /hɛj/ (or /ˈhɛi/?), ^{a}ϩⲉⲉⲓⲉ /ˈhɛ:jə/
- *r-prj.t* "temple" > ^{s}ⲣⲡⲉ /r̩ˈpɛ/, ^{b}ⲉⲣⲫⲉⲓ /ərˈpʰɛj/ (or /ˈərˈpʰɛi/?), ^{a}ⲣⲡⲉⲉⲓⲉ /r̩ˈpɛ:jə/. This word was borrowed into Egyptian Arabic as بِربا *ˈbirba* (probably from Sahidic ⲡⲉ-ⲣⲡⲉ "the temple" with definite article) and is preserved in the name ⲯⲉⲙⲉⲣⲫⲉⲓ > سَبِرباى *Sabirˈbāy* of a village in the Nile delta (probably from Bohairic)[188]. The word

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[187] For more examples of this kind see Osing (1976a: note 98 on p. 432f.).

[188] See Timm (1984-1992: vol. 5, p. 2262f.) and Vycichl (1983: 176).

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has likewise been borrowed into Old Nubian as ⲁⲣⲡⲁⲉ- ~ ⲁⲣⲫⲁⲉ- “temple”.[189]

- *mꜣwṯ* (ˈmiꜣVwtV) “to think” (since MK) > ^{s,a}ⲙⲉⲉⲩⲉ /ˈmɛːwə/, ^{b}ⲙⲉⲩⲓ
- *ṯbw.t* (ˈṯabVwtV) “sandals” > ^{s,a}ⲧⲟⲟⲩⲉ /ˈtɔːwe/, ^{b}ⲑⲱⲟⲩⲓ (with irregular loss of ‹b›, ☞ § 3.16.6)

If the preceding consonant was not lost, then it directly precedes the glide in Coptic. There is thus a tendency for the glide to be vocalized. ‹w› is preserved as a consonant in some dialects of Coptic, and vocalized to /u/ in others. ‹j› is always vocalized; however in most varieties of Coptic it does not develop into /i/ – as might be expected –, but it merges with /ə/. Only in certain varieties of Lycopolitan is it indeed written ⲓ and thus kept distinct from the final vowel /ə/ that is written ⲉ here (☞ §§ 5.8.5, 5.8.6.7):

- *rsw.t* (ˈrVsVwtV) “dream” > ^{s}ⲣⲁⲥⲟⲩ /ˈrasu/, ^{a}ⲣⲉⲥⲟⲩ, ^{b}ⲣⲁⲥⲟⲩⲓ /ˈraswi/, ^{f}ⲗⲉⲥⲃⲓ
- *mtw.t* “poison” > ^{s}ⲙⲁⲧⲟⲩ /ˈmatu/, ^{a}ⲙⲉⲧⲟⲩ, ^{b}ⲙⲁⲑⲟⲩⲓ /ˈmatwi/, ^{f}ⲙⲉⲧⲃⲓ
- *pḥ.wï* “back” > ^{s,a}ⲡⲁϩⲟⲩ /ˈpahu/, ^{b}ⲫⲁϩⲟⲩ
- *šnw.t* “granary” > ^{b}ϣⲉⲩⲛⲓ /ˈʃɛwni/ (with metathesis)
- *ṯzi̯.i* > *ṯzi̯.w* (‹w› is only graphical, ☞ § 3.13.2) “to be exalted (stative)” > ^{l}ϫⲁⲥⲓ /ˈcasi/, ^{s}ϫⲟⲥⲉ /ˈcɔsə/
- *mniw* (ˈmVnViwV) “herdsman” > ^{s}ⲙⲁⲛⲉ /ˈmanə/, should be *ⲙⲁⲛⲓ in Lycopolitan which is accidently not attested

As is true for ‹j› / ‹ꜣ› in contact with the stressed vowel, the glide may be missing without appearant rule:

- *ḥfꜣw* “Schlange” (ˈḥafVꜣwV) > ^{s,b}ϩⲟϥ /ˈhɔf/
- *šsꜣw* “Antilope” > ^{s,b}ϣⲟϣ /ˈʃɔʃ/ (borrowed as *sūsu* into Neo-Assyrian)
- *nꜥi̯.i* > *nꜥi̯.w* “to go (stative)” > ^{s,b}ⲛⲁ /ˈna/

3.14.3 Loss of ‹t› and ‹r›

The conditions for the loss of ‹t› and ‹r› are basically identical. Instances of ‹ṯ› which merged with ‹t› by palatal fronting (☞ § 3.9.7) are treated like original ‹t› with respect to loss.

3.14.3.1 ‹t› / ‹r› preceding the stressed vowel

‹t› / ‹r› were preserved when a stressed vowel followed directly:

- *ntk* (n[V]ˈtakV) “you” > ^{s}ⲛⲧⲟⲕ /n̩ˈtɔk/, ^{b}ⲛⲑⲟⲕ
- *tḫ.t* (ˈtiḫtV) “to be drunk” > ^{s}ϯϩⲉ /ˈtihe/, ^{b}ⲑⲓϧⲓ
- *ṯnï* (ˈṯanjV) “where?” > ^{s}ⲧⲱⲛ /ˈton/, ^{b}ⲑⲱⲛ
- *rmṯ* (ˈramṯV) “man” > ^{s}ⲣⲱⲙⲉ /ˈromə/, ^{b}ⲣⲱⲙⲓ
- *ḫr.t* (ḫ[V]ˈritV) “need” > ^{s}ϩⲣⲉ /ˈhrɛ/, ^{b}ϧⲣⲉ

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[189] See Browne (1996: 20) and Roquet (1972: 106-108).

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3.14.3.2 Intervocalic ‹t› / ‹r›

All cases discussed in this section concern *t* or *r* following the stressed vowel. It is possible that the rules are true for *t* and *r* preceding the stressed vowel as well. But the syllable structure rules do not allow us to reconstruct the syllabification of the pretonic section of any word, so I cannot adduce any evidence in favor of this claim or against it.

‹t› / ‹r› were lost in intervocalic position. This applies regardless to whether they are the last consonant in a word:

- *p.t* ('pVtV) "sky" > ^{s}ⲡⲉ /'pɛ/, ^{b}ⲫⲉ
- *n-ṯ* ('niṯV) "to you (fem.)" > ^{s,b}ⲛⲉ /'nɛ/
- *ẖr.t* (ẖ[V]'ritV) "need" > ^{s}ϩⲣⲉ /'hrɛ/, ^{b}ϧⲣⲉ
- *zw.t* (z[V]'watV) "wheat" > ^{s,b}ⲥⲟⲩⲟ /'swɔ/
- *ḥr* ('ḥarV) "face" > ^{s,b}ϩⲟ /'hɔ/
- *ḥqr* (ḥ[V]'qarV) "to be hungry" > ^{s,b}ϩⲕⲟ /'hkɔ/

or not:[190]

- *itrw* ('jatVrwV) "river, Nile" > *irw* (alternative writing since Dynasty 18, Lacau 1970c: 73) > ^{s}ⲉⲓⲟⲟⲣ /'jɔːr/, ^{b}ⲓⲟⲣ
- *itrw* "mile" (since MK: CT spell 466 = de Buck 1935-1961: V, 353f.) > *ir* (Late Period and Demotic, Erichsen 1954: 6), not attested in Coptic
- *ptr* (NK) > *pr* (NK and later) "bandages", not attested in Demotic and Coptic[191]
- *mtr.t* ('mVtVrtV) "noon" (since early NK) > ^{s}ⲙⲉⲉⲣⲉ /'mɛːrə/, ^{b}ⲙⲉⲣⲓ
- *ir.t-f* ('jVrVtfV) "his eye" > ^{s}ⲉⲓⲁⲧϥ /'jatf/ ~ ^{s}ⲉⲓⲁⲁⲧϥ /'jaːtf/, ^{b}ⲓⲁⲧϥ
- *mri̯.t* ('mirVjtV) "to love" > ^{s}ⲙⲉ /'mɛ/, ^{b}ⲙⲉⲓ /'mɛj/ (or /'mɛi/), ^{a}ⲙⲉⲓⲉ /'mɛjə/

‹t› is irregularly preserved in *mtw.t* ('mVtVwtV) "poison" > ^{s}ⲙⲁⲧⲟⲩ, ^{b}ⲙⲁⲑⲟⲩⲓ (perhaps by analogy to a status pronominalis like *_mVt'wVt-_, which, however, cannot be confirmed from Coptic).

3.14.3.3 ‹t› / ‹r› in consonant clusters

‹t› / ‹r› were preserved as the first component of a consonant cluster:

- *ir.t-f* ('jVrVtfV) "his eye" > ^{s}ⲉⲓⲁⲧϥ /'jatf/, ^{b}ⲓⲁⲧϥ

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[190] According to the traditional syllable structure rules, ‹t› / ‹r› were believed to have been syllable-final in all these cases. It was then difficult to explain why ‹t› was lost here whereas it was preserved in cases like *mtrw* "witness" > ⲙⲛⲧⲣⲉ, where it was also considered syllable-final in the traditional theory and still is so in mine. Lacau (1970c) suggested an additional condition that *t* within the cluster *-tr-* was lost only when following a stressed vowel.

[191] For attestations see Caminos (1954: 136) and Westendorf (1981). The word seems to be a loan from a Semitic root √*ptl* "to twist; string, cord", cf. Caminos (1954: 136), Hoch (1994: no. 158), Meeks (1997: 41).

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- *mtrw* (mVt'rVwV) “witness” > ^{s}ⲙⲛⲧⲣⲉ /m̩[n]t'rɛ/, ^{b}ⲙⲉⲑⲣⲉ
- *ḥtp* ('ḥatpV) “to be content” (since MK) > ^{s,b}ϩⲱⲧⲡ /'hotp/
- *ỉr.t* ('jirtV) “to do” > ^{s}ⲉⲓⲣⲉ /'irə/, ^{b}ⲓⲣⲓ
- *ỉtrw* ('jatVrwV) “river, Nile” > ^{s}ⲉⲓⲟⲟⲣ /'jɔ:r/, ^{b}ⲓⲟⲣ

They were lost, however, as the second component of a cluster:

- *ỉr.t* ('jirtV) “to do” > ^{s}ⲉⲓⲣⲉ /'irə/, ^{b}ⲓⲣⲓ
- *mwt* ('mawtV) “to die” > ^{s,b}ⲙⲟⲩ /'mu/
- *rmṯ* ('ramṯV) “man” > *rmt* > ^{s}ⲣⲱⲙⲉ /'romə/, ^{b}ⲣⲱⲙⲓ
- *zbṯ* ('zabṯV) “to laugh” > *zbt* > ^{s}ⲥⲱⲃⲉ /'soβə/, ^{b}ⲥⲱⲃⲓ
- *sḥn.t* ('saḥVntV) “to command” (since MK) > ^{s}ⲥⲁϩⲛⲉ /'sahnə/, ^{b}ⲥⲁϩⲛⲓ
- *nfr* ('nafrV) “good” > ^{s}ⲛⲟⲩϥⲉ /'nufə/, ^{b}ⲛⲟⲩϥⲓ
- *snṯr* ('sanVṯrV) “incense” > ^{s}ⲥⲟⲛⲧⲉ /'sɔntə/, ^{b}ⲥⲟⲛϯ

A possible explanation for this loss would be that at a certain stage of the language progressive assimilation took place in consonant clusters, e.g.: ('jirtV) = /'jirt(ʰ)V/ > /'jirrV/ > /'irə/.

3.14.3.4 ‹t› / ‹r› in unstressed word-initial position

‹t› is always preserved in unstressed word-initial position:

- *twtw* (t[V]'watwV) “image” > ^{s}ⲧⲟⲩⲱⲧ /'twot/, ^{b}ⲑⲟⲩⲱⲧ
- *tmꜣy.t* (tVm'ꜣVytV) “mat” (since MK) > ^{s}ⲧⲙⲏ /'tme/, ^{b}ⲑⲙⲏ

The same is also true for ‹r› in most words:

- *r-prj.t* (r[V]-'pVrVjtV) “temple” > ^{s}ⲣⲡⲉ /r̩'pɛ/, ^{b}ⲉⲣⲫⲉⲓ
- *rmy.t* “tear” (since MK) > ^{s}ⲣⲙⲉⲓⲏ /r̩m'je/ (or /rm̩'je/?), ^{b}ⲉⲣⲙⲏ

But in three very common words ‹r› was lost:

- *r* (r[V]-, *proclitic*) “to, from, than” > ^{s,b}ⲉ- /ə/- (some scholars assume that the preposition should be read *ỉr* rather than *r*, e.g. Edel 1955/64: §76σ)
- *rḫ* (r[V]ḫ[V]-, *proclitic*) “can” > ^{s,b}ϣ- /ʃ/-
- *rḏi̯.t* “to give” > ^{s,b}ϯ /'ti/

3.14.3.5 Morphophonological alternations and analogical levelling

Conditioned phonetic developments as described in the preceding sections could lead to morphophonological alternations if a consonant was lost in some forms of the verb and preserved in other forms of the same verb. Cf.:

- *ḥqr* (ḥ[V]'qarV) “to become hungry” > ^{b}ϩⲕⲟ /'hkɔ/
- *ḥqr.w* ('ḥaqVrwV) (*stative of the same verb*) > ^{b}ϩⲟⲕⲉⲣ /'hɔkər/

However, alternations like these were eliminated by analogical levelling in most verbs. ‹t› and ‹r› were either irregularly conserved in all forms:

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- *wmt* (w[V]'matV) “to become thick” ≠ ^{s,b}ⲟⲩⲙⲟⲧ /ˈwmɔt/
- *wmt.w* ('wamVtwV) (*stative of the same verb*) > ^{s}ⲟⲩⲟⲙ(ⲛ)ⲧ /ˈwɔmt/, ^{b}ⲟⲩⲟⲙⲧ

- *mr* ('mVrV) “to bind” ≠ ^{s,b}ⲙⲟⲩⲣ /ˈmur/
- *mr.w* ('murwV) (*stative of the same verb*) > ^{s,b}ⲙⲏⲣ /ˈmer/

- *šnṯ* ('šanṯV) (> *šnt*) “to quarrel” ≠ ^{s,b}ϣⲱⲛⲧ /ˈʃont/
- *šnṯ.w* ('šanVṯwV) (> *šnt.w*) (*stative of the same verb*) > ^{s,b}ϣⲟⲛⲧ /ˈʃɔnt/

- *ꜣšr* ('ꜣašrV) “to roast” ≠ ^{s}ⲱⲣϣ /ˈorʃ/ “to be scorched; to be cold” (with metathesis)
- *ꜣšr.w* ('ꜣšVrwV) (*stative of the same verb*) > ^{s}ⲟⲣϣ /ˈɔrʃ/ (with metathesis)

or they were irregularly eliminated in all forms:

- *ḫpr* ('ḫaprV) “to become” > ^{s}ϣⲱⲡⲉ /ˈʃopə/, ^{b}ϣⲱⲡⲓ
- *ḫpr.w* ('ḫapVrwV) (*stative of the same verb*) ≠ ^{s}ϣⲟⲟⲡ /ˈʃɔ:p/, ^{b}ϣⲟⲡ

- *zwr* ('zawrV) “to drink” > ^{s,b}ⲥⲱ /ˈso/
- *zwr-f* ('zawVrfV) “to drink it” ≠ ^{s}ⲥⲟⲟϥ /ˈsɔ:f/, ^{b}ⲥⲟϥ

The Coptic dialects sometimes disagree in their choice of development:

- *sḫt* ('saḫtV) “to weave” > ^{b}ⲥⲱϧⲓ, ^{s}ⲥⲱϩⲉ (regular) vs. ^{s}ⲥⲱϩⲧ (by analogy)
- *sḫt.w* ('saḫVtwV) (*stative of the same verb*) > ^{b}ⲥⲏϧⲓ (by analogy) vs. ^{s}ⲥⲁϩⲧ (regular)

In the verb *mwt* “to die, (late also:) to kill”, both alternatives came to split into two distinct Coptic verbs:
1) ^{s}ⲙⲟⲩ /ˈmu/ “to die”, and 2) ^{s}ⲙⲟⲩⲟⲩⲧ /ˈmu:t/ “to kill”.
This is easy to understand: Transitive verbs frequently make use of the *status pronominalis* of the infinitive (infinitive before pronominal object suffixes) in which final *-t* had to be retained regularly, and thus analogy favored the preservation of *-t* in the base form of the infinitive as well where it should have been otherwise lost. This analogy is less evident for an intransitive verb.[192]
Similarly, the verb *rḫt* “to wash, to mill textiles” (since MK) split into two verbs ^{s}ⲣⲱϩⲉ (stative ^{s}ⲣⲁϩⲉ) “to wash” vs. ^{s}ⲣⲱϩⲧ (stative ^{s}ⲣⲁϩⲧ) “to pound”. The regular phonetic developments should have produced a verb * ^{s}ⲣⲱϩⲉ (stative ^{s}ⲣⲁϩⲧ).

Just as for verbs, there can be morphophonological alternation in nouns, e.g.:

- *ḏr.t* ('ḏartV) “hand” > ^{s}ⲧⲱⲣⲉ /ˈtorə/, ^{b}ⲧⲱⲣⲓ
- *ḏr.t-f* ('ḏarVtfV) “his hand” > ^{s}ⲧⲟⲟⲧϥ /ˈtɔ:tf/, ^{b}ⲧⲟⲧϥ

- *nṯr* ('naṯrV) “god” > ^{s}ⲛⲟⲩⲧⲉ /ˈnutə/, ^{b}ⲛⲟⲩϯ
- *nṯr.w* (n[V]'ṯurwV) “gods” > ^{s}ⲉⲛⲧⲏⲣ /n̩ˈter/

or analogical levelling as in:

- *šr.t* “nose” ≠ ^{s}ϣⲁ /ˈʃa/, ^{b}ϣⲁⲓ
- *šr.t-f* “his nose” > ^{s,b}ϣⲁⲛⲧϥ /ˈʃantf/ (with irregular intrusive -ⲛ-)

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[192] On the development of *mwt* see Till (1937: 133f.) and Vycichl (1957b: 11f.).

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3.14.3.6 Possible cases of an irregular preservation of ‹t›

As we saw, *t* was usually lost in Coptic when it was the last consonant in a word. This loss is already evidenced by Egyptian transcriptions into cuneiform of the New Kingdom. In Egyptian texts from the same time, word-final ‹t› is not strictly omitted in all of these cases. Rather ‹t› may be freely written or omitted at the end of almost any word and has thus ceazed to be a reliable phonogram at that time. However, new graphical means developed to clearly express *t* that was still spoken (group writing, ☞ § 5.4.2). Ward (1985: 333-335) cites a few nouns in which Late Egyptian shows "unambiguous" writings of this type for word-final *-t* in native words in which this sound probably should have disappeared. If his interpretation is correct, this would indicate that these words had irregularly preserved *-t*.

There is evidence for this phenomenon from later periods only in the names of two goddesses, if the Greek transcriptions can be trusted: *mw.t* > Greek Μουϑ, also preserved in the Coptic place name ⲡⲉⲧⲉ-ⲙⲟⲩⲧ (Vycichl 1983: 165), and *n.t* > Greek Νηιϑ. It must be taken into consideration that the Egyptian writings of both goddesses are somewhat difficult to interpret, so perhaps *-t* was not actually the last consonant in these words.

If *-t* was indeed irregularly preserved here, this might be the result of an archaizing "book-pronunciation" of these divine names; they would then be comparable to the *mots savants* of the Romance languages.

3.14.3.7 Possible cases of an irregular loss or preservation of ‹r›

The word *hrw* "day" > ^{s}ϩⲟⲟⲩ /hɔːw/, ^{b}ⲉϩⲟⲟⲩ /ə'hɔw/, ^{a}ϩⲟⲟⲩⲉ /hɔːwə/ presents difficulties. In the Egyptian form, *r* may have either preceded the stressed vowel (h[V]'rawV) or followed it ('har[V]wV). Sethe (1899-1902: I, §§ 160a and 239) chooses the first solution which agrees with the quality of the Coptic stressed vowel according to the syllable structure rules. This might also explain why Bohairic has a prosthetic ⲉ-. However, both the quantity of the Coptic stressed vowel[193] and the loss of ‹r› can only be explained by the second solution which was preferred by Lacau (1902: 201-206) and all subsequent scholars (e.g. Fecht 1960: 177; Vycichl 1983: 317f.).

There are two more expressions in which *-r-* is lost irregularly:

- *iḫ r-k* "what is to you?; why do you (...)?" (since NK) > ^{b}ⲁϧⲟ-ⲕ /a'xɔk/, but ^{s}ⲁϩⲣⲟ-ⲕ /ah'rɔk/ with regular preservation of *-r-*.
- *ḫr-f* "so says he" > ^{l}ϩⲁϥ /'haf/ (Osing 1976a: note 496 on p. 583f.)

It is difficult to assume that the reason for this loss is the neighborhood of ϩ/ ϧ as Fecht (1960: 29) argues. As Vycichl (1983: 23) rightly remarks, there are a large number of Coptic words in which ⲣ is preserved in contact with ϩ/ ϧ.

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[193] The vowel must be long as is evidenced by the epenthetic final -ⲉ in Akhmimic, ☞ § 5.8.2.

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Many verbal tense formations of Coptic are etymologically derived from a combination of a form of the verb *ir.t* ('jirtV) “to do” – which in isolation becomes ^{s}ⲉⲓⲣⲉ /'irə/, ^{b}ⲓⲣⲓ – and the infinitive of the main verb. When the forms of *ir.t* became proclitic tense prefixes by the time of Coptic, *-r-* was preserved or lost under unknown conditions. The picture has been obscured by analogical levelling, and interdialectal as well as intradialectal variation is frequent. Cf.:

Loss of *-r-*:

- *iri̯-i* “I did” > ^{s,a,b}ⲁⲓ- (1st pers. sg. perfect I prefix)

Retention of *-r-*:

- *ḫr iri̯* “use(s) to do” > ^{s,b}ϣⲁⲣⲉ-, ^{a}ⳉⲁⲣⲉ- (prenominal aorist prefix)
- *i.iri̯-ṯ* “you (fem.) do” > ^{s}ⲉⲣⲉ-, ^{a,b}ⲁⲣⲉ- (2nd pers. sg. fem. present II prefix)

Variation:

- *i.iri̯* “do(es)” > ^{s}ⲉⲣⲉ-, ^{b}ⲁⲣⲉ-, ^{a}ⲁⲣⲉ- ~ ⲁ-[194] (prenominal present II prefix)
- *iri̯-ṯ* “you [fem.] did” > ^{s}ⲁ- ~ ⲁⲣ- ~ ⲁⲣⲉ-, ^{b}ⲁⲣⲉ-, ^{a}ⲁ- ~ ⲁⲣ-[195] (2nd pers. sg. fem. perfect I prefix)
- *ḫr iri̯-i* “I use to do” > ^{s,b}ϣⲁⲓ-, ^{a}ⳉⲁⲣⲓ- (1st pers. sg. aorist prefix)
- *ḏi̯.t iri̯-i* “to cause that I do” > ^{s}ⲧⲣⲁ-, ^{b}ⲑⲣⲓ-, ^{a}ⲧⲁ- “that I do” (1st pers. sg. causative infinitive prefix)

There are rare, uncertain cases in which ‹r› may have been replaced by /j/ instead of having been lost completely:

- *ḥqr.ti* “to be hungry (stative)” > ^{s}ϩⲕⲟⲉⲓⲧ /'hkɔjt/. This may however be a secondary creation based on the infinitive of this verb, ^{s,b}ϩⲕⲟ, which had lost ‹r› regularly.
- *qrs.t* “burial” > ^{s}ⲕⲁ(ⲉ)ⲓⲥⲉ /'kajsə/ (but this should perhaps rather be read /ka'isə/, ☞ § 5.6.6.2).

3.14.4 Loss of ‹d›

As a rule, ‹d› and ‹ḏ› are not lost:

- *ꜣbd* “month” > ^{s}ⲉⲃⲟⲧ /ə'βɔt/, ^{b}ⲁⲃⲟⲧ
- *ꜣpd* “bird” > ^{s}ⲱⲃⲧ /'oβt/
- *ḥḏ* “silver” > ^{s,b}ϩⲁⲧ /'hat/
- *ḫnd* “to tread” > ^{s}ϩⲱⲛⲧ /'hont/, ^{b}ϧⲱⲛⲧ “to approach”
- *sd* “tail” > ^{s,b}ⲥⲁⲧ /'sat/
- *dmḏ* “to join” > ^{s,b}ⲧⲱⲙⲧ /'tomt/

The only exception to this rule is the very common verb *ḏd* ('ḏadV) “to say” > ^{s,b}ϫⲱ /'co/ and its derivation *sḏd.t* ('siḏVdtV) “to tell” (attested since Middle Kingdom) > ^{s}ϣⲁϫⲉ /'ʃacə/. These examples are not enough for us to assume a conditioned sound loss of ‹d›;

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[194] On the forms see Polotsky (1960: 419).

[195] On the forms see Polotsky (1960: 414f.).

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rather they must simply be regarded as irregular verbs. It is interesting to see that the verb *ḏd* has an allomorph *ḏt* (written ‹ḏdt› and similarly) in Late Egyptian (Winand 1992: 47).

3.14.5 Loss of ‹n›

In a few cases ‹n› is lost, sometimes with compensatory lengthening of the preceding vowel. The examples are comparatively few, and a rule is not evident. Some examples are the following:[196]

- *mṯn* "way" > ^{s}ⲘⲞⲈⲒⲦ /ˈmɔjt/, ^{b}ⲘⲰⲒⲦ
- *nhï-n* "some" (since NK)> ^{s}ϨⲞⲈⲒⲚⲈ /ˈhɔjnə/ "some", in proclitic position > ^{s}ϨⲈⲚ- /hən/ *pluralic indefinite article*
- *ntï* relative pronoun > ^{s,b}ⲈⲦ~ⲈⲦⲈ
- *dnj.t* "portion" (since NK) > ^{s}ⲦⲞⲈ /ˈtɔə/, ^{b}ⲦⲞⲒ
- The status pronominalis of *zni̯* "to pass" (> ^{s}ⲤⲒⲚⲈ, ^{b}ⲤⲒⲚⲒ) is ^{s}ⲤⲀⲀⲦ-~ⲤⲚⲦ-, ^{b}ⲤⲈⲚ-
- The verb *qni̯* "to become fat" (> ^{s}ⲔⲚⲚⲈ, ^{b}ⲔⲈⲚⲒ) forms a stative ⲔⲒⲰⲞⲨ in Sahidic (but ⲔⲈⲚⲒⲰⲞⲨⲦ in Bohairic).

Certain Egyptian writings[197] suggest that the loss of *-n* could already have taken place by the New Kingdom, as was the case for most other consonantal losses. However, the place name *ḥw.t-nn-nzw* (written *ḫi-ni-in-ši* in Neo-Assyrian transcription, 7th century BC) lost its second *n* as late as the mid of the 1st millennium BC (written ανυσις by Herodotos, Coptic ^{s}ϨⲚⲎⲤ) (cf. Peust 1992: 123f.).

The word *itn* "sun" forms part of the Queen's name *mry.t-itn* which is attested in cuneiform transcriptions of the time of the New Kingdom as *ma-ja-tu* ~ *ma-ja-a-ti*.[198] It is unclear whether *-n* was actually lost in this noun, or whether the final vowel is an attempt to transcribe a syllabic sonorant /n̩/ of Egyptian.

The possessive prefix *pꜣ-n* "belonging to" (attested since NK) loses its *-n* by the time of Coptic: ^{s}ⲠⲀ, ^{b}ⲪⲀ. However this seems to be a late generalization of a loss which was not originally appropriate in all environments. Consider the proper name *pꜣ-n-ꜣs.t*, lit. "who belongs to Isis", which can still be written *pꜣ-n-ꜣs.t* (beside *pꜣ-ꜣs.t*) in Demotic and is transcribed as παν-ησις beside πα-ησις into Greek. The Coptic form of this name is ⲠⲀⲎⲤⲈ. (On this name see Lüddeckens & Thissen 1980ff.: 354.) I assume that *-n-* was regularly preserved here preceding the noun *ꜣs.t* > ⲎⲤⲈ which had a vocalic onset in Later Egyptian, whereas the *-n*-less form ⲠⲀ was introduced into this name only by analogy.

The 3rd pers. pl. pronominal suffix *-sn* was confused with the 3rd pers. sg. fem. suffix *-s*

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[196] For more examples see Osing (1976: note 534 on p. 592f.) and Vycichl (1990: 220f.).

[197] See Capart & Gardiner & van de Walle (1936: 180), Erman (1933: § 47), Westendorf (1966: 147f.).

[198] Albright (1937: 191), von Soden (1952: 432).

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especially in Late Egyptian, and sometimes already in the Middle Kingdom.[199] This confusion was perhaps due to a phonetically conditioned loss of *-n*. Ultimately, *-sn* was replaced by a new suffix pronoun *-w* (Coptic -ⲞⲨ). However traces of *-sn* seem to have been preserved in -ⲤⲈ ~ -ⲤⲞⲨ, a rare allomorph of -ⲞⲨ in Sahidic (cf. Till 1926: 127-130 and Vycichl 1983: 183).

On a late weakening or loss of /n/ in certain varieties of Coptic ☞ § 5.7.2.

3.14.6 Loss of ‹m›

Loss of ‹m› is rare, conditions for it are unknown. Examples:

- *mr-iḥ.w* "overseer (of) cattle" > ^{s}ⲈⲖⲞⲒϨ /əˈlɔjh/ "shepherd"
- *šm.t* "to go" > ^{s,b}ϢⲈ /ˈʃɛ/
- *ḥm* "rudder" > ^{s}ϨⲒⲈ~ϨⲒⲚⲒⲈ, ^{b}ϨⲒⲈ
- The word *nnšm* "spleen" > ^{s}ⲚⲞⲈⲒϢ /ˈnɔiʃ/, ^{b}ⲚⲰⲒϢ shows loss of both *n* and *m*.

For more possible cases cf. Osing (1976a: 472 and note 785 on p. 688-690).

3.14.7 Loss of ‹h› and ‹ḥ›

h is generally preserved in Coptic. However *h* (not *ḥ*) is lost in Sahidic when directly following an (original) aspirate stop, whereas it is always preserved in Bohairic (☞ § 3.2.4).

There are several examples of a loss of *ḥ* under other conditions. The basic rule seems to be that *ḥ* is lost in word onset position before unstressed Ⲁ in Bohairic.[200] It is possible that *ḥ* was first voiced to ʿ and then took part in the regular loss of this sound in Coptic. However Egyptian writings with ʿ < *ḥ* are not attested. It should be noted that the vowel quality of Ⲁ itself ultimately results from the former neighborhood of *ḥ* (☞ § 5.8.4).

Examples:

- *ḥtr* "span of horses; couple" > ^{s}ϨⲀⲦⲢⲈ vs. ^{b}ⲀⲐⲢⲈ
- *ḥw.t-ḥr* "Hathor (divine name)" > ^{s}ϨⲀⲐⲰⲢ vs. ^{b}ⲀⲐⲰⲢ (name of the 3rd month of the Coptic year, ☞ appendix 6)

In a few more words, *ḥ* is lost irregularly especially in Akhmimic and Sahidic:

- *nḥḏ.t* (since OK) ~ *nḏḥ.t* (since MK) "tooth" (on this word see Bardinet 1990: 27-48) > ^{s}ⲚⲀϪϨⲈ ~ ⲚⲀⲀϪⲈ, ^{a}ⲚⲈⲈϪⲈ, ^{b}ⲚⲀϪϨⲒ
- ^{s}ⲀⲨⲰ, ^{a}ⲀⲞⲨ, ^{b}ⲞⲨⲞϨ "and", a derivation from the verb *wꜣḥ* "to put; to add"
- ^{s}ⲞⲈⲒⲘⲈ, ^{a}ⲀⲈⲒⲘⲈ, ^{b}(Ϩ)ⲰⲒⲘⲒ "hook", a derivation from *ḥꜣm* "to catch fish"[201]

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[199] Cf. Kroeber (1970: 32-35).

[200] See Fecht (1985: 92f.), Vergote (1973/83: Ib, § 28i), Sethe (1925: 53), and Vycichl (1990: 136).

[201] See Osing (1976a: note 553 on p. 598) and Vycichl (1983: 155).

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3.14.8 Development of compounds

We saw that *t* and *r* are always lost as the last consonant in a word. However, this loss may be suppressed in certain compounds:

- *nb.t-ḥw.t* "Nephthys (divine name)" > is attested as νεφθυς in Greek transcription and as ⲛⲉⲫⲑⲱ in Old Coptic
- *nfr.t-jrï* "the most beautiful" (female proper name) is attested as *na-ap-te-ra*[202] in cuneiform transcription of the NK
- *nfr-ḥr* "with beautiful face (male proper name)" is attested as νεφερως in Greek transcription and as ⲛⲉⲃⲉⲣϩⲟ in Coptic (Lüddeckens & Thissen 1980ff.: 641).
- *ḥw.t-ḥrw* "Hathor (divine name)" > ^{s}ϩⲁⲑⲱⲣ, ^{b}ⲁⲑⲱⲣ (name of the 3rd month of the Coptic year, ☞ appendix 6)

I assume that in these compounds the final vowel of the first component was elided at an early time (for this elision ☞ § 5.8.6, 6.2.2.4), so that *t* / *r* was followed by a consonant and consequently retained according to the rule discussed in § 3.14.3.3.

The noun *pr* "house" is found in numerous compounds, especially place names. The *-r* is sometimes lost and sometimes retained in these compounds, no clear rule being visible.

-r lost:

- *pr-bꜣst.t* "house of Bastet (goddess)", a place name > ^{b}ⲡⲟⲩⲃⲁⲥϯ
- *pr-nb* "house of gold", a place name > ⲡⲓⲛⲟⲩⲃ

-r retained:

- *pr-ꜥꜣ* "great house" > ^{s}ⲡ-ⲣⲣⲟ, ^{b}ⲡ-ⲟⲩⲣⲟ "Pharaoh, the king" (ⲡ reinterpreted as definite article)
- **pr-pꜣ-nṯr* "house of the god", a place name > ⲡⲉⲣⲡⲛⲟⲩⲧⲉ

For these and more examples see Redford (1963) and Gardiner (1947: II, *206f.). Redford (1963: 122) remarks that some of the names which retain the *r* are late formations from a time when the general loss of word-final *-r* had already taken place. He therefore suggests that the forms without *-r* reflect the normal development while the retention of *-r* is caused by an archaizing book-pronunciation of the same word *pr*. It is difficult to judge whether such a scenario is possible. The noun *pr* preceded by the definite article (*pꜣ-pr*) is transcribed as *pi-pa-ru* in an Egyptian-cuneiform glossary of the New Kingdom (Edel 1975: 15). If Redford's suggestion is correct, then *pi-pa-ru* must likewise have been an archaizing book-pronunciation (*mot savant*). This is difficult to accept since the definite article is a feature of the modern, non-archaizing language of the New Kingdom. Another proposal is made by Fecht (1960: 83f.). He assumes that there was not only a single word *pr*, but that different derivations from one root were hidden behind a uniform writing. According to Fecht, one of these forms lost *-r*, while another (*prj*?, *prw*?) retained it.

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[202] Edel (1994a: II, 363). *-r-* in *nfr.t* is missing in the transcription and was perhaps pronounced as a syllabic *r̥* which could not be rendered in the cuneiform script.

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3.15 Long consonants

In Semitic languages such as Arabic, Biblical Hebrew, and Gəʿəz, long consonants (traditionally called geminate consonants) occur but are not normally indicated in writing. They are expressed by a single consonant letter.[203] By analogy, scholars generally assume that geminates might have existed in Egyptian but are nevertheless not recognizable in the Egyptian script (cf. e.g. Vycichl 1983: x, xxvii). Some scholars have tried to prove the existence of geminate consonants based on Coptic vocalism (☞ § 4.8.6). Note also the fact that one of two identical consonants can be omitted in writing if they meet at a morpheme boundary (occasionally even at a word boundary), e.g. *nḫt* "to be strong" + *.ti* (stative ending 2nd pers. sg.) > *nḫtti* ~ *nḫti*) (see Erman 1920; Gardiner 1957: § 62 and p. 422).

At the present state of knowledge, it is impossible to decide whether or not phonologically long consonants should be assumed for Pre-Coptic Egyptian.

In Coptic, there is no indication that long consonants existed within a morpheme. Original sequences of two identical consonants were frequently simplified:

- *ỉnn* "we" > ^{s,b}ⲁⲛⲟⲛ /a'nɔn/ in stressed position, but ⲁⲛ /an/[204] in unstressed position (*nn* > *n*).
- *ntï tw-ỉ* (relative particle + conjugational prefix 1st pers. sg.) > ^{s,b}ⲉϯ- /əti/- (*tt* > *t*)
- *psš.t* "half" > ^{s}ⲡⲁϣⲉ /'paʃə/, ^{b}ⲫⲁϣⲓ (*sš* > **šš* > *š*)
- *sṯi̯.t-f* "to sow it" > ^{s,b}ⲥⲁⲧ-ϥ /'satf/ (*ṯt* > **tt* > *t*)
- ^{s}ϫⲟⲩⲧ- /cut-/ "20" + ^{s}-ⲧⲏ /'te/ "5" > ^{s}ϫⲟⲩⲧⲏ /cu'te/ "25"

Long consonants from Semitic loan words have usually been simplified as well (☞ appendix 5). However, an original long consonant could occasionally be substituted by a sequence nasal + consonant (cf. Hintze 1953: 29f.); e.g. Semitic **tVppVḥ* "apple" (Arabic تفاح *tuffāḥ*) > Late Egyptian *dpḥ* > Coptic ^{s}ϫⲙⲡⲉϩ ~ ϫⲏⲡⲉϩ, ^{b}ϫⲉⲙⲫⲉϩ "apple".

Syllabic sonorants preceding a vowel are written double in Coptic. This phenomenon should not however be confused with long consonants (☞ § 5.10.3).

Coptic does admit two identical consonants at a (synchronic) morpheme boundary, cf.:

- ^{s}ⲡ-ⲡⲱϣ /'ppoʃ/ "the division"
- ^{s}ⲧ-ⲧⲟ- /'ttɔ/ (besides ⲧⲟ-) "to demand (status pronominalis)", from ⲧ- (causative prefix) + ϯ "to give"

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[203] In Hebrew or Arabic texts provided with punctuation marks, consonant length can be indicated by a specific diacritic (called *dâgeš* in Hebrew, *tašdīd* in Arabic).

[204] Aside from ⲁⲛⲛ which is sporadically found in old manuscripts, cf. Funk (1991: 14).

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3.16 Assimilation and dissimilation of consonants

Assimilations of consonants are on the whole not very frequent in Egyptian, or at least they are not frequently reflected in writing. Egyptian is an inflecting language, so if two consonants were in direct contact within a certain verbal or nominal form, they could very well be separated by a vowel in other forms of the paradigm. If there was a reason for assimilation in the first case, it would have been disfavored by the existence of related forms in which assimilation could not take place.

3.16.1 *n* > *m* before labials

Original *n* develops into *m* in direct contact before labials. The assimilation seems to be regular within a morpheme, but examples are scarce:

- *inbꜣ* “dumb” > ^{s}ⲘⲠⲞ /m̩'pɔ/ (Bohairic has ⲈⲂⲞ)
- *nbꜣ* “spindle” > ^{s}ⲘⲠⲀⲒ /m̩'paj/, ^{b}ⲘⲂⲀⲒ (Osing 1976a: note 980 on p. 782-786)
- *rnp.t* “year” > ^{s}ⲢⲞⲘⲠⲈ /'rɔmpə/, ^{b}ⲢⲞⲘⲠⲒ

As a result, the sequences ⲚⲠ and ⲚⲘ are uncommon in Coptic unless a morpheme boundary intervenes.

This assimilation is not regular across a morpheme boundary. However the final -Ⲛ of some proclitic elements may develop into -Ⲙ before a labial.[205]

Assimilation is common (obligatory at least in Sahidic) for instance with:

- the definite plural article ^{s}Ⲛ-
- the preposition ^{s}Ⲛ- “in, to, from; (attributive marker)”
- the preposition ^{s}ϨⲚ- “in”
- the negation ^{s}Ⲛ- “not”
- the verb ^{s}ϬⲚ- “to find (status nominalis)”

However it is absent for instance in:

- the indefinite plural article ^{s}ϨⲈⲚ-
- the preposition ^{s}ϪⲒⲚ- “from”
- the negation ^{s}ⲘⲚ- “there is not”

There is variation with the conjugational prefix 1st pers. pl. ^{s}ⲦⲚ- “we”: ^{s}ⲦⲚ-ⲘⲈ ~ ⲦⲘ-ⲘⲈ “we love”, ^{s}ⲦⲚ-ⲠⲒⲤⲦⲈⲨⲈ ~ ⲦⲘ-ⲠⲒⲤⲦⲈⲨⲈ “we believe”.

The labials that cause assimilation are Ⲡ, Ⲙ; in Bohairic also Ⲃ; but not Ϥ, ⲞⲨ. No assimilation takes place before Ⲙ filling the syllable nucleus: ^{s}Ⲙ-ⲘⲎⲤⲈ /m̩'mesə/ '“the interests” (for *Ⲛ-ⲘⲎⲤⲈ), but ^{s}Ⲛ-ⲘⲖⲞⲞϨ /nm̩'lɔːh/ “the fights” (cf. Till 1951: 65-67).

There are also indications that ‹q› could provoke an assimilation *n* > *m* at a Pre-Coptic stage. I have concluded from this that ‹q› frequently expressed a labiovelar stop /kʷ/ (or similarly), ☞ § 3.7.4.

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[205] The topic has not yet been researched in detail. Cf. the remarks by Ernštedt (1986: 106-108), Shisha-Halevy (1986: 160 with note 27), Till (1955: § 35 and 1961: § 14).

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Intervening ϩ does not necessarily block the assimilation, cf. ^{a}ⲙ-ϩⲙⲉ (for *ⲛ-ϩⲙⲉ) "in forty" (see Vycichl 1934: 733). I have suggested in § 3.5.2 that the graphical clusters ⲛϩ and ⲙϩ may have been realized as single nasals with breathy voice ([n̤], [m̤]) rather than as sequences of nasal + [h].

3.16.2 The change *m* > *n* by analogy

While *n* frequently assimilates to a following labial, *m* is not normally affected by a following consonant in its place of articulation[206], cf.:

- ^{s}ⲙⲧⲟ /m̩'tɔ/, ^{b}ⲙⲑⲟ "presence" < *mtr*
- ^{s}ⲟⲩⲟⲙⲧⲉ /'wɔmtə/ "fortification tower" < *wmt.t.*
- ^{s,b}ϣⲟⲙⲧ[207] /'ʃɔmt/ "three" < *ḫmtw*

The Egyptian preposition *m* "in" (in the status nominalis) seems to be a counterexample. It frequently alternates in writing with the preposition *n* "to" from the New Kingdom on (cf. Erman 1933: §§ 47, 205, 599, 603), and both prepositions have merged into a single preposition ⲛ (ⲙ before labials) in Coptic. I assume however that this merger was phonetically justified only before labials, which was a common environment since prepositions often preceded the masculine definite article *pꜣ* (ⲡ in Coptic). When both prepositions became indistinguishable here, this morphological merger was generalized to all other environments. So the change *m* > *n* is not a phonetic process (as is held e.g. by Vergote 1945: 103) but a development by analogy.
The shift *m* > *n* also affected some compounds formed with the preposition *m*, e.g. *m-ꜥ* "in the arm of = near, at, with", written *mdj* ~ *ndj* in Late Egyptian > ^{s,b}ⲛⲧⲉ-.

There are several fossilized proper names in which the preposition *m* was preserved as /m/ into the Late Period:

- *ỉyi̯-m̱-ḥtp* "coming in peace", rendered as *ymḥwt*~*ʔmḥwt* in Aramaic (Vittmann 1989a: 226), as *ymḥt* in Phoenician (Vittmann 1989b: 94), and as ιμουϑ(ης) in Greek (Lüddeckens & Thissen 1980ff.: I, 55)
- *ỉmn-m̱-ḥꜣ.t* "Amun (god) is in front", rendered as αμμενεμη(ς) in Greek (Osing 1976a: 344)
- *wꜣḥ-ỉb-rꜥ-m̱-ꜣḫ.t* "Apries (king) is in the horizon", rendered as *wḥprꜥmḥy* ~ *wḥprymḥy* in Aramaic (Vittmann 1989a: 226)
- *mnṯw-m̱-ḥꜣ.t* "Month (god) is in front", rendered as μοντομη(ς) in Greek (Lüddeckens & Thissen 1980ff.: I, 597)
- *ḥr-m̱-ꜣḫ.t* "Horus (god) is in the horizon", rendered as *ḫar-ma-ki*, *ḫa-ar-ma-ḫi-iʾ* et var. in Neo-Assyrian and Neo-Babylonian cuneiform (Edel 1980: 37-40), as *ḥrmḥy* in Aramaic (Vittmann 1989a: 228), and as αρμαχι(ς) in Greek (Vycichl 1983: 307)

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[206] However rare writing variants with -ⲛⲧ- instead of -ⲙⲧ- can be found in Coptic, see Ernštedt (1986: 108).

[207] On the writing ϣⲟⲙⲛⲧ which is more common in Sahidic ☞ § 3.17.1.

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- *ḥr-m̱-ḥb* “Horus (god) is in the feast”, rendered as αρμα(ις) in Greek (Lüddeckens & Thissen 1980ff.: I, 812)
- *ẖʿi̯-m̱-wꜣs.t* “who has risen in Thebes”, rendered as *ẖa-a-ma-aš-ši* ~ *ẖa-a-maš-ši* in cuneiform of the time of the New Kingdom (Albright 1946a: 10),[208] as χαμοις ~ χομοις ~ χαμμωις ~ χομμουις in Greek (Albright 1946a: 10, Vycichl 1983: 519).

3.16.3 Merger *nw* > *m* by dental dissimilation

In some words, the sequence /nw/ conflated into /m/. Such cases have been collected by Lacau (1970a)[209]; some examples are:

- *n-wn* (n[V]-'wan) (since OK) “there is not” > *mn* (since NK) > ^{s,b}ⲙⲙⲟⲛ /m̩'ɔn/
- *rnn-wt.t* (r[V]n[V]n-'wattV) (name of a goddess) > Greek transcription ερμουτις, preserved in the Coptic month name ^{s}ⲡⲁ-ⲣⲙⲟⲩⲧⲉ /par'mutə/, ^{b}ⲫⲁ-ⲣⲙⲟⲩⲑⲓ. An exceptional by-form ⲡⲁ-ⲣⲛⲟⲩⲧⲉ in which the merger did not apply is attested once (Westendorf 1965/77: 151).
- *hꜣnw*[210] ('haꜣVnwV) “wave” (since NK) > ^{s}ϩⲟⲉⲓⲙ /'hɔjm/, ^{b}ϩⲱⲓⲙⲓ “wave”
- *ẖnnws*[211] ('ẖanVnwV-sV) (early New Kingdom) “mosquito” > *ẖnms* (since New Kingdom) > ^{s,b}ϣⲟⲗⲙⲉⲥ /'ʃɔlməs/. This word seems to have been borrowed into Ancient Greek as κώνωψ “gnat, mosquito” (<*'kɔnɔms), cf. Pierce (1971: 104).
- *kꜣnw* (k[V]'ꜣanwV) (Old Kingdom) “garden” > *kꜣm* (since NK) > ^{s,b}ϭⲱⲙ /'kʲom/. In Semitic there is a wide-spread root *krm* “vineyard” (e.g. Hebrew כֶּרֶם “vineyard”, Arabic كرم *karm-* “vineyard, grapes”). The Egyptian word could not have been borrowed from Semitic, nor could both be inherited from Proto-Afroasiatic, as is generally assumed (e.g. by Vycichl 1983: 340f.). Rather the Semitic word must have been borrowed from Egyptian at a time when the sound change *nw* > *m* had already taken place but ‹ꜣ› still had the value /r/. Akkadian *karānu* “wine”, however, may be genetically related to Egyptian *kꜣnw*.
- *ḏꜣn.w* (ḏV'ꜣanwV) (OK) “young people” > *ḏꜣm* (since MK) > ^{s}ϫⲱⲙ /'com/ “generation” (Bohairic has ϫⲱⲟⲩ /'cow/ with irregular -ⲟⲩ; perhaps *-n-* was lost early here)

The following observations can be made:

1) Writings with *m* first appear in the Middle Kingdom and more regularly in the New

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[208] Cuneiform *m* renders both [m] and [w]; here we have to assume that it renders a sequence *-mw-*.

[209] Cf. also Osing (1976a: note 678 on p. 653f.).

[210] Also written without ‹ꜣ›. But ‹ꜣ› must be part of the phonological structure of the word since it left a trace as (ⲉ)ⲓ both in the singular ^{s}ϩⲟⲉⲓⲙ, ^{b}ϩⲱⲓⲙⲓ and in the plural ^{s}ϩⲓⲙⲏ of the noun (differently Osing 1976a: note 1025 on pp. 803f.).

[211] Lacau (1970a: 52) argues rightly that the reading *ẖnws* preferred by Wb III 290,2f. fails to explain ⲗ. The syllable structure of this word is, however, abnormal; perhaps *-s* is to be regarded as a suffix (Lacau ibid.) which is metrically irrelevant.

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Kingdom. We conclude that the sound change took place approximately at the time of the Middle Kingdom, but historical orthography conserved the older writing ‹nw› for a while, especially in the divine name *rnn-wt.t*.

2) The sound change took place before *w* was lost according to the rules discussed in § 3.14.2.7.

3) In addition to the group /nw/, one of the consonants *n* or *ꜣ* was present in the word. If neither *n* or *ꜣ* was present, the merger did not apply, cf. words like the following (all attested from the OK on): *ỉwnw* "Heliopolis (city)" > ^{s}ⲰⲚ; *ḫmnw* "eight" > ^{s}ϢⲘⲞⲨⲚ, ^{b}ϢⲘⲎⲚ; *ẖnw* "interior" > ^{s}ϨⲞⲨⲚ, ^{b}ϦⲞⲨⲚ; *zwnw* "Arzt" > ^{s}ⲤⲀⲈⲒⲚ, ^{b}ⲤⲎⲒⲚⲒ; *šnw.t* "granary" > (with metathesis) ^{b}ϢⲈⲨⲚⲒ.

4) The consonants *n* and *w* were in direct contact. Otherwise the merger did not apply, cf. *nwꜣ* "to see" (since Middle Kingdom)[212] > ^{s,b}ⲚⲀⲨ. It should be noted that our explanation only works if the new syllable structure rules are accepted. Based on the traditional rules, /n/ and /w/ would not be in direct contact in *hꜣnw*, *ḫnnws*, *kꜣnw*, and *ḏꜣn.w*.[213]

We conclude that around the time of the Middle Kingdom /nw/ merged into /m/ if another /n/ or ‹ꜣ› /r/ was present in the same word. This process is a mutual assimilation (/nw/ > /m/) and a dissimilation (/n/ changes its place of articulation due to the presence of another dental sonorant) at the same time.

Two difficult words remain in which a development *nw* > *m* has been proposed:

- *ḥn.t* (reading somewhat ambiguous) "pelican" > Coptic ^{b}ϨⲘⲎ ~ ϨⲎⲘⲎ ~ ϨⲨⲘⲎ "pelican". The semantic similarity seems striking. However the change *nw* > *m* assumed here by Lacau (1970a: 50f.) makes it necessary to suppose a consonant *w* which is not clearly obvious from the Egyptian writing. Furthermore, final -Ⲏ of Coptic seems to presuppose a second unwritten consonant (Vycichl 1983: 299 transcribes the word as *ḥnww.t*).
- *ḥnw.t* "bowl" (since OK) > ^{s}ϨⲞⲘⲈ (etymology by Osing 1976a: note 822 on p. 710). There is no additional *n* or *ꜣ* in this word to cause dissimilation, nor are *n* and *w* in direct contact (according to my syllable structure rules). If the etymology is valid, I have to assume a spontaneous sound change *n* > *m* which is not related to the cases discussed in this section.

Sethe (1899/1902: I, § 228) suggests a graphical explanation for the phenomenon. He assumes that the grapheme ‹n› had an alternative phonographic value /m/ in addition to /n/. This solution, which was accepted by Czermak (1931/34: 25) and Albright (1946b: 320), raises serious difficulties: 1) Not only one but several *n*-graphemes would then have

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[212] For reading and early attestations see Osing (1976a: note 200 on p. 503f.) and Habachi (1985: 36, line 6).

[213] In discussing the development of *hꜣnw*, Lacau (1970a: 53f.) feels that *n* and *w* ought to be in direct contact and admits that this is problematic based on the traditional syllable structure rules.

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to be considered polyphonic (𓈖 , ○ , 𓇒𓇒). 2) As I have shown, *m* only develops in a well-defined phonetic environment. 3) The negation *n* is not affected in isolation (> ⲛ) but only in composition with following *wn* (> ⲙⲙⲟⲛ). Sethe's approach was rejected by Vergote (1945: 104) and can no longer be accepted nowadays.

3.16.4 Sonorant shift

3.16.4.1 General remarks

A sonorant is not infrequently shifted when there is another sonorant in the same word. Sonorants in this sense are ‹m›, ‹n›, ‹r› (/r/ and /l/), ‹b› /β/, but not /j/ and /w/. In the following sections, I cite some illustrative examples. More examples can be found in Lacau (1922), Osing (1976a: note 419 on p. 549f. and note 556 on p. 598f.), and Vycichl (1990: 112).

Exact rules are hard to provide. The developments sometimes go in opposite directions, e.g. in the neighborhood of *m*, *n* may develop into *r* but *r* may also develop into *n*. The first process can be called nasal dissimilation, the second one nasal assimilation. The only strict rule, basically recognized already by Lacau (1922), seems to be that the nasal sequence /nm/ was never preserved as such when these segments were in direct contact with one another.

For possible examples of a shift *n* > *l* without the presence of another sonorant ☞ § 3.11.7.

However, most sonorants are left unchanged in the presence of other sonorants, e.g.:

- *ỉbnw* "alum" > ^{s}ⲟⲃⲛ /ˈɔβn/, ^{b}ⲱⲃⲉⲛ
- *ỉn-m* "who?" > ^{s,b}ⲛⲓⲙ /ˈnim/
- *mỉ-nȝ* "here" > ^{b}ⲙⲛⲁⲓ /ˈmnaj/
- *mnḏ* "breast" > ^{b}ⲙⲛⲟⲧ /ˈmnɔt/
- *mry.t* "harbor" > ^{s}ⲙⲣⲱ /ˈmro/, ^{b}ⲉⲙ(ⲃ)ⲣⲱ
- *mtr.t* "noon" > ^{s}ⲙⲉⲉⲣⲉ /ˈmɛːrə/, ^{b}ⲙⲉⲣⲓ
- *nbw* "gold" > ^{s,b}ⲛⲟⲩⲃ /ˈnuβ/
- *nmt.t* "step" > ^{s}ⲛⲟⲙⲧⲉ /ˈnɔmtə/, ^{b}ⲛⲟⲙϯ "strength"
- *rmṯ* "man" > ^{s}ⲣⲱⲙⲉ /ˈromə/, ^{b}ⲣⲱⲙⲓ

3.16.4.2 n > r in the neighborhood of m

- *ỉwnỉ-mnṯw* (place name) > ^{s}ⲣⲙⲟⲛⲧ /ṛˈmɔnt/ *et var.* (☞ appendix 9)
- *ỉnhmn* (a fruit) >(?) ^{s}ϩⲣⲙⲁⲛ /hṛˈman/, ^{b}(ϩ)ⲉⲣⲙⲁⲛ "pomegranate". The words for "pomegranate" in Semitic languages (e.g. Arabic رمان *rummān-*, Akkadian *lurmû*) likewise seem close to the Coptic form, so ϩⲣⲙⲁⲛ may be directly borrowed from Semitic or at least influenced by it. Cf. Hoch (1994: no. 12).
- The late proper name *pȝ-ỉ.ḏỉ-ỉwn-mw.t-f* is transcribed in Greek as πετεαρμουθου

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(Greek genitive case) (Lüddeckens & Thissen 1980ff.: I, 324). *iwn-mw.t-f* itself is a divine name attested from the OK on.

- *pꜣ-n-imn-ḥtp.w* (month name) > ^{s}ⲡⲁⲣⲙϩⲟⲧⲡ /parm̩ˈhɔtp/ (☞ appendix 6)
- *mnš.t* "yellow color", cf. ^{s,b}ⲙⲏⲣϣ /ˈmerʃ/ "red, yellow"
- *nmḥw* "poor" > Demotic *nmḥ* "free" > ^{s}ⲣⲙϩⲉ /rm̩ˈhɛ/, ^{b}ⲣⲉⲙϩⲉ, ^{f}ⲗⲉⲙϩⲏ "free"
- *rmny.t* (a square measure) > ^{s}ⲣⲉⲣⲙⲏ /rərˈme/ (with metathesis)

3.16.4.3 *r > n in the neighborhood of m*

- Egyptian **rm* (Dynasty 18) "with" > Late Egyptian *irm* "with" > νομ (= /nəm/ or similarly) in a Greek transcription from 202/1BC; Coptic ^{b}ⲛⲉⲙ /nəm/.[214]

3.16.4.4 *n > l in the neighborhood of m*

- *mnḥ* "wax" > ^{s}ⲙⲟⲩⲗϩ /ˈmulh/, ^{b}ⲙⲟⲩⲗϩ
- *nhm* "to shout" > ^{s}ⲗϩⲏⲙ /l̩ˈhem/, ^{b}ⲉⲗϩⲉⲙ
- *ḥnk.t* "braided lock of hair", cf. ^{s,b}ϩⲱⲗⲕ /ˈholk/ "to plait"
- *ḫnm* "to smell" > ^{s}ϣⲱⲗⲙ /ˈʃolm̩/, ^{b}ϣⲱⲗⲉⲙ
- *knm* "to wrap", cf. ^{s}ⲕⲗⲟⲙ /ˈklɔm/, ^{b}ⲭⲗⲟⲙ "crown" (Osing 1976a: note 686 on p. 655)

Note that ‹n› can also be a rendering of /l/, at least in Later Egyptian (☞ § 3.11.7).

3.16.4.5 *n > l in the neighborhood of n*

- *mꜥnn* "a kind of cord" > ^{s}ⲙⲁⲛⲓⲛ ~ ⲙⲁⲗⲗⲓⲛ ~ ⲙⲁⲗⲓⲗ
- *nnw* "primeval water" is preserved in Coptic as ^{s,b}ⲛⲟⲩⲛ /ˈnun/ "abyss". Vycichl (1972) suggests that the modern name of the river Nile is also related to this root. This is the common name of the river in Greek sources (Νεῖλος, first attested in Hesiod, 8th century BC), which then spread into the other European languages and into Arabic (*nīl*). However in Egyptian and Coptic the usual name of the Nile was not *nnw* but *itrw* or *itrw ꜥꜣ* (> ^{s}ⲉⲓⲉⲣⲟ /jəˈrɔ/), at least in the written language.

3.16.4.6 *m > β in the neighborhood of n*

- *mn.t* "swallow" > ^{s}ⲃⲏⲛⲉ /ˈβenə/, ^{b}ⲃⲏⲛⲓ~ⲃⲓⲣⲓ
- *mn.t* "crucible" > ^{b}ⲃⲓⲛⲓ /ˈβini/

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[214] This preposition is discussed by Edel (1967: 67-73). In Dynasty 18 only the extended form *rm-n* is attested which, according to Edel, is still preserved in Coptic as ^{a}ⲙⲛ with loss of the first consonant. The other cited forms are derived from the shorter variant *rm*. In Sahidic both ⲙⲛ (?< *rm-n*) and ⲛⲙ (< *rm*) are attested. On νομ see Pestman (1977: no. 11, lines 3 and 6); for the date of the text see Vandorpe (1986: 300).

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- *ḥw.t-nm*(ʿ) "to sleep" > ^{s}ϩⲓⲛⲏⲃ /hi'neβ/, but ^{b}ϩⲓⲛⲓⲙ /hi'nim/[215]

3.16.4.7 β > m in the neighborhood of n

- *nb* "any, every" > ^{s}ⲛⲓⲙ /nim/, but ^{b}ⲛⲓⲃⲉⲛ with obscure suffix -ⲉⲛ
- *ṯb-nṯr* (place name), transcribed as *ṣ/zab-nu-ú-ti* in Neo-Assyrian (Borger 1996: 21) and as Σεβεννυτος in Greek, > ^{s}ϫⲉⲙⲛⲟⲩⲧ /cəm'nut/, ^{b}ϫⲉⲙⲛⲟⲩϯ. The modern Arabic name is سمنود *Samannūd*.

3.16.4.8 n > l / r in the neighborhood of β

- *ỉnb* "to include (by a wall)" > Demotic *ỉrb* (Osing 1976a: note 630 on p. 621f.)
- *bnw* "to disappear" > Demotic *bl*, ^{s,b}ⲃⲱⲗ /'βol/ "to loosen" (Osing 1976a: note 637 on p. 624)
- *bnd* (kind of garment) > ^{s}ⲃⲁⲗⲟⲧ /βa'lɔt/ (Osing 1976a: note 831 on p. 713, Wilson 1997: 321)
- *nbꜣ* "spindle" > ^{a}ⲗⲃⲉⲓ /l̩'βɛj/; but without dissimilation ^{b}ⲙⲃⲁⲓ and, with irregular ⲡ, ^{s}ⲙⲡⲁⲓ (Osing 1976a: note 980 on p. 782-786)
- *nbi̯* "to burn" (since OK) > Demotic *lbj* > ^{s}ⲗⲓⲃⲉ /'liβə/ "to rage" (etymology by Kammerzell 1994a: 33)
- *nsb* "to lick" (since OK) > ^{b}ⲗⲁⲡⲥⲓ /'lapsi/ "to bite" (cf. also Arabic لسب *lasaba* "to sting, to bite", *lasiba* "to lick")

3.16.4.9 r > n in the neighborhood of r

- In Bohairic, the prefix of the negative imperative ⲙⲡⲉⲣ- /m̩pər-/ (< *m jri̯.w*) is replaced by ⲙⲡⲉⲛ- when preceding the prefix ⲑⲣⲉ- /'trə-/ of the "causative infinitive" (Mallon 1956: 125, for exceptions see Polotsky 1934: 63).

3.16.4.10 m > β and β > m in the neighborhood of r / l

- *mrkbt* "chariot" (from Semitic, ☞ appendix 5) > ^{s}ⲃⲉⲣⲉϭⲱⲟⲩⲧ ~ ⲃⲣϭⲟⲟⲩⲧ, ^{b}ⲃⲉⲣⲉϭⲱⲟⲩⲧⲥ
- Semitic **mVnšār-* > **mVššār-* (e.g. Hebrew מַשּׂוֹר "saw") > ^{s,b}ⲃⲁϣⲟⲩⲣ /βa'ʃur/ "saw"
- Semitic **baṣal* "onion" > Demotic *mḏl* > ^{s,b}ⲙϫⲱⲗ /m̩'col/ "onion"

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[215] It is disputed whether the second element should be read *nm* or *nm*ʿ in Egyptian (cf. Hoch 1994: no. 249 and Quack 1996: 510). If the reading without ʿ is correct, which is also supported by the absence of vowel doubling in Sahidic, the word may well be a loan from the Semitic root √*nwm* "(to) sleep". For the vowel difference in the Coptic dialect forms ☞ § 5.6.3.1.

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3.16.4.11 Variant developments

Different varieties of Egyptian occasionally show different sonorant shifts in the same word:

- *mn.t* "swallow" develops to ⲃⲏⲛⲉ /ˈβenə/ in Sahidic but to ⲃⲓⲣⲓ /ˈβiri/ (besides ⲃⲏⲛⲓ) in Bohairic
- *ẖnm.t* "well (of water)" > ^{s}ϩⲟⲛⲃⲉ /ˈhɔnβə/, but ^{l}ϩⲁⲗⲙⲉ /ˈhalmə/
- The verb *ẖnm* "to unite" is attested in Late Period writings which suggest that it could be pronounced *ẖnb* on the one hand and *ẖr*(*m*) on the other.[216] This verb is not preserved in Coptic.

3.16.5 Palatal assimilation

Former *s* (including ‹z›) frequently develops into a palatal sibilant ϣ /ʃ/ in Coptic by assimilation to another palatal in the word. The phenomenon is discussed in detail by SETHE (1899-1902: I, § 272). The principal rules are the following:

s usually becomes ϣ if there is another ϣ (< *š*) somewhere in the same word:

- *zšn* (originally perhaps *zššn*[217]) "lotos" > ^{b}ϣⲱϣⲉⲛ /ˈʃoʃən/
- *ššd* "window" > ^{s,b}ϣⲟⲩϣⲧ /ˈʃuʃt/, ^{a}ϣⲱϣⲧ
- *šmsi̯* "to serve" > ^{s,a}ϣⲙϣⲉ /ˈʃm̩ʃə/, ^{b}ϣⲉⲙϣⲓ
- *ššꜣw* "antelope" > ^{s,b}ϣⲟϣ /ˈʃɔʃ/ (borrowed as *sūsu* into Neo-Assyrian)

An unexplained exception is *šꜣs* "nomad" > ^{s,a}ϣⲱⲥ /ˈʃos/ "herdsman"

A palatal sibilant ϣ which is derived from *ḫ* causes assimilation in Bohairic only:

- *ḫsf* "to repulse" > ^{s}ⲥⲱϣϥ /ˈsoʃf/ (with metathesis), ^{a}ϩⲱⲥϥ, ^{b}ϣⲱϣϥ "to despise"
- *sʿnḫ* "to nourish" > ^{s}ⲥⲁⲁⲛϣ /ˈsa:nʃ/, ^{a}ⲥⲁⲁⲛϩ /ˈsa:nx/, ^{b}ϣⲁⲛϣ /ˈʃanʃ/
- *sfḫw* "seven" > ^{s}ⲥⲁϣϥ /ˈsaʃf/, ^{a}ⲥⲁϩϥ, ^{b}ϣⲁϣϥ (metathesis in all dialects)
- *sḫw* "gall" > ^{s}ⲥⲓϣⲉ /ˈsiʃə/, ^{a}ⲥⲓϩⲉ, ^{b}ϣⲁϣⲓ

There is no assimilation in *wsḫ* "to be large" > ^{s,b}ⲟⲩⲱϣⲥ /ˈwoʃs/ (with metathesis), ^{a}ⲟⲩⲱⲥϩ.

If an original palatal stop (i.e. ϭ / ϫ < *ḏ* / *ṯ*) follows somewhere in the same word, *s* is assimilated, though not always in all dialects:

- *msḏr* "ear" > ^{b}ⲙⲁϣϫ /ˈmaʃc/, ^{l}ⲙⲉϣϫⲉ (^{s}ⲙⲁⲁϫⲉ, ^{a}ⲙⲉⲉϫⲉ have lost *s*)
- Demotic *sḏ* "locust" > ^{s,b}ϣϫⲉ /ˈʃcɛ/, ^{a}ⲥϫⲉ
- *sḏd* "to talk" > ^{s}ϣⲁϫⲉ /ˈʃacə/, ^{a}ϣⲉϫⲉ, ^{b}ⲥⲁϫⲓ
- *sṯni̯* "to distinguish" > ^{s}ϣⲟϫⲛⲉ /ˈʃɔcnə/, ^{a}ϣⲁϫⲛⲉ, ^{b}ⲥⲟϭⲛⲓ "to consider"

If it precedes, there is no assimilation:

- *ṯzi̯* "to lift" > ^{s,a}ϫⲓⲥⲉ /ˈcisə/, ^{b}ϭⲓⲥⲓ

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[216] See VITTMANN (1980, especially note 3 on p. 76) and ZAUZICH (1975).

[217] It is not clear whether *zššn* is an early form of *zšn* or whether it is another word. OSING (1976a: note 1262 on p. 851) opts for the latter possibility.

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A palatal stop derived from *g* / *k* (☞ § 3.9.4) has an even less palatalizing effect. It can only affect *s* in direct contact:

- *sg* “stupid” > ^{s}ⲥⲟϭ /ˈsɔkʲ/, ^{b}ⲥⲟϫ, ^{a}ⲥⲉϭⲉ
- *sgb* “cry” > ^{s,a}ϣϭⲁⲡ /ˈʃkʲap/, ^{b}ϣⲕⲁⲡ
- Demotic *sgr* “to sail” > ^{a}ⲥϭⲏⲣ /ˈskʲer/, ^{s}ⲥϭⲏⲣ ~ ϣϭⲏⲣ, ^{b}ϣϭⲏⲣ
- *gsr* “ring” > ^{s}ⲍⲟⲩⲣ ~ ϭⲥⲟⲩⲣ, ^{b}ϣϭⲟⲩⲣ (with metathesis) (for the etymology see Hoch 1994: no. 523; Vittmann 1996: 444)

The palatalization of *s* can occasionally already be observed in Demotic (cf. Sethe 1899-1902: I, § 272; Osing 1976a: note 511 on p. 586-588).

In some words, *s*/*z* and *š* are fully assimilated and render a single ϣ in Coptic:

- *psš* (ˈpasšV) “to divide” > ^{s}ⲡⲱϣ /ˈpoʃ/, ^{b}ⲫⲱϣ
- *sšp.t* (s[V]ˈšaptV) “cucumber” > ^{s}ϣⲱⲡⲉ /ˈʃopə/, ^{b}ϣⲱⲡⲓ
- *sȝšr.t* (s[V]ȝˈšurtV) “bread” > ^{b}ϣⲏⲣⲓ /ˈʃeri/
- *šzp* “to receive” > ^{s,b}ϣⲱⲡ /ˈʃop/

In words of this type, palatal assimilation can be observed even earlier (cf. e.g. Westendorf 1962: § 61). The noun *sȝšr.t* “bread” is attested in the writing *šȝšr.t* already by the early Middle Kingdom (James 1962: 60).

3.16.6 Other cases of assimilation and dissimilation

A few more examples of assimilation or dissimilation exist which cannot be explained by one of the above-mentioned rules:

- *psḏ* “9” renders ⲯⲓⲧ /ˈpsit/ in Bohairic as expected, whereas Akhmimic and mostly also Sahidic have ⲯⲓⲥ /ˈpsis/ (*t* > *s* by assimilation at a distance).
- The Egyptian verb “to see” has three allomorphs *mȝȝ*, *mȝ*, and *mȝn*, later > *mn* (Smith 1984). Traditionally *mȝȝ* is considered the base form, which would suggest that *ȝȝ* was dissimilated to *ȝn* in certain forms of this verb. It is equally possible to assume that *mȝn* is the base form and *mȝȝ* is the result of assimilation. The verb is attested from Old Egyptian to Demotic but has not survived in Coptic.
- The noun *mfȝk.t* “turquoise” appears as *nfk* and in similar writings in Later Egyptian (cf. Osing 1976a: note 1111 on p. 829 and Vycichl 1983: 117f.). *n* probably developed from *m* by dissimilation against *f*.
- *kȝš.ỉ* “Nubian” develops into ⲉϭⲱϣ /əˈkʲoʃ/ as expected in Sahidic, whereas Bohairic has ⲉⲑⲱϣ /əˈtʰoʃ/. The expected Bohairic form would have been *ⲉϭⲱϣ where ϭ would be /cʰ/. This seems to be a case of palatal dissimilation against /ʃ/.
- *ṯbw.t* (ˈṯabVwtV) “sandal”, also written *tw* since the New Kingdom > ^{s,a}ⲧⲟⲟⲩⲉ /ˈtɔːwə/, ^{b}ⲑⲱⲟⲩⲓ /ˈtʰowi/. The preservation of *-w-* is regular in this position (☞ § 3.14.2.7). The Sahidic writing is ambiguous but the Akhmimic form indicates that the stressed vowel was indeed long in Coptic (☞ § 5.3.3). The long vowel is to be explained by the loss of *-b-* according to the rules given in § 5.5.10.2. *b* seems to

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have undergone a dissimilatory loss due to the presence of another labial in the same word.

- *dqr* ~ *dgr* “fruit” renders ^{s}ϯϭⲉ /ˈtikʲə/ in Sahidic whereas Bohairic has ^{b}ϫⲓϫⲓ /ˈcici/ with irregular assimilation at a distance.

For a possible assimilation of *t* and *r* to directly preceding consonants which may have taken place at some time prior to the New Kingdom ☞ §§ 3.14.3.3 and 4.8.5 and cf. note in § 5.5.10.2.

3.17 Epenthesis

3.17.1 Intrusive ⲛ in Sahidic

In Sahidic, the sequence /mt/ is usually written ⲙⲛⲧ if ⲧ is syllable-final. ⲛ is clearly secondary from an etymological point of view. The phenomenon is unknown in Bohairic.

- *mtr.w* “witness” > ^{s}ⲙⲛⲧⲣⲉ /m̩[n]tˈrɛ/ (or /m[n̩]tˈrɛ/), ^{b}ⲙⲉⲑⲣⲉ /mətˈrɛ/
- *ḫmtw* “three” > ^{s}ϣⲟⲙⲛⲧ /ˈʃɔm[n]t/, ^{b}ϣⲟⲙⲧ /ˈʃɔmt/

I assume that a non-phonemic transitional [n] was articulated between ⲙ /m/ and ⲧ /t/. Vergote (1945: 103) however suggests that in the sequence /mt/ the dental stop was spoken as a voiced allophone [d] which was written ⲛⲧ. If this were true, we should expect that /t/ was voiced and written ⲛⲧ also after other sonorants such as ⲗ /l/ and ⲣ /r/, but this is not the case.

In verbs, the writing may be inconsistent because of influence from other forms within the paradigm:

- *wmt.w* “to be thick (stative)” > ^{s}ⲟⲩⲟⲙⲧ ~ ⲟⲩⲟⲙⲛⲧ, ^{b}ⲟⲩⲟⲙⲧ (infinitive ^{s,b}ⲟⲩⲙⲟⲧ)
- *dmḏ* “to meet” > ^{s}ⲧⲱⲙⲧ ~ ⲧⲱⲙⲛⲧ, ^{b}ⲧⲱⲙⲧ

No ⲛ is inserted if ⲧ is syllable-initial:

- *mtr* “presence” > ^{s}ⲙⲧⲟ /m̩ˈtɔ/, ^{b}ⲙⲑⲟ /m̩ˈtʰɔ/
- *ḫmt.t* “three (fem.)” > ^{s}ϣⲟⲙⲧⲉ /ˈʃɔmtə/, ^{b}ϣⲟⲙϯ (but also ^{s}ϣⲟⲙⲛⲧⲉ by analogy with the masc. ϣⲟⲙⲛⲧ)

3.17.2 Intrusive ⲡ and ⲃ

Between ⲙ and a following syllable-initial consonant an epenthetic labial stop is facultatively inserted in Coptic. Attestations are rare in Sahidic, somewhat more frequent in Bohairic. I do not discuss the other dialects here. Cf.:[218]

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[218] This topic was discussed by Hintze (1949). Epenthesis can also take place before a syllable-initial consonant cluster: ^{s}ⲧⲙⲧⲣⲉ- ~ ⲧⲙⲡⲧⲣⲉ- /tm̩[p]trə-/ (prefix of negated causative infinitive).

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- *mry.t* "harbor" > ^{s}ⲙⲣⲱ /m̥'ro/ ~ (once:) ⲉⲙⲡⲣⲱ [əm'bro], ^{b}ⲉⲙⲃⲣⲱ ~ ⲉⲙⲣⲱ.

The epenthetic labial stop is written as follows:

	ⲙ + voiced sonorant (ⲣ, ⲗ)	ⲙ + voiceless obstruent (ⲧ, ⲥ, ϣ)
labial stop inserted in Sahidic	ⲡ	ⲡ
labial stop inserted in Bohairic	ⲃ	ⲡ

Hintze (1949: 47-49) explains convincingly that an epenthetic non-phonemic voiced (before voiced sonorants) or voiceless (in the other cases) stop could be spoken in these words. Since ⲃ in Sahidic is always a writing of a fricative /β/, ⲡ had to be written in both cases. In Bohairic, where ⲃ is also basically a fricative but has a regular allophone [b] (☞ § 3.12.5), the voiced stop was consequently expressed as ⲃ.

Roquet (1995), while presenting several good examples of ⲡ-epenthesis, is certainly wrong in interpreting ⲙⲡ as an expression of a voiceless nasal [m̥]. This neither explains the epenthesis of ⲡ before voiced sonorants in Sahidic nor the ⲃ-writings of Bohairic.

3.17.3 Epenthesis of ⲓ / ⲟⲩ before a sonorant in Bohairic

If the vowel /i/ follows a sonorant (ⲃ, ⲗ, ⲙ, ⲛ, ⲣ) in Bohairic, the same vowel is also frequently written before that sonorant whereas it is absent in the other dialects and cannot be explained etymologically. This ⲓ can be called epenthetic:[219]

- ^{b}ⲙⲁⲓ-ⲛⲓⲃⲉⲛ ~ (rarely:) ⲙⲁ-ⲛⲓⲃⲉⲛ, but ^{s}ⲙⲁ-ⲛⲓⲙ "everywhere", composed of ^{s,b}ⲙⲁ "place" < *mꜥ* and ^{s}ⲛⲓⲙ, ^{b}ⲛⲓⲃⲉⲛ "every" < *nb*

ⲓ-epenthesis is also evoked by posttonic /i/ corresponding to Sahidic ⲉ /ə/ (these are actually most of the examples):

- ^{b}ⲁⲙⲏⲓⲣⲓ, but ^{s}ⲉⲙⲏⲣⲉ "inundation", borrowed into Egyptian Arabic as /di'mi:ra/ ~ /di'me:ṛa/ "time of flood" (Hinds & Badawi 1986: 304, Vittmann 1991: 209)
- ^{b}ⲁϧⲱⲓⲣⲓ ~ ⲁϧⲱⲣⲓ "viper" (absent in Sahidic)
- ^{b}ϣⲁⲓⲣⲓ ~ ϣⲁⲣⲓ, but ^{s}ϣⲁⲁⲣⲉ "to hit" < *ḥꜥr*
- ^{b}ϩⲏⲓⲃⲓ ~ ϩⲏⲃⲓ, but ^{s}ϩⲏⲃⲉ "grief" < *ḥb*

The phonetic interpretation of this phenomenon is doubtful. The writing may indicate that a glide-like element was spoken before the sonorant (e.g. ⲁⲙⲏⲓⲣⲓ [a'meĭri]). It is also possible that the sonorant was palatalized (ⲁⲙⲏⲓⲣⲓ [a'merʲi]). In any case, it is probably a subphonological phenomenon.

Several languages indicate a palatal consonant by an adjacent palatal vowel sign in writing. In Old French, ‹i› is frequently added to the right and/ or to the left of a palatal consonant. For example, the word for "to bath" (< Latin *balneāre*) is found as *bagner*,

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[219] Thus already Polotsky (1930: note 3 on p. 876). I reject Osing's (1976a: 388f. and note 132 on p. 468-475) assumption that -ⲓ- is original in these words and was secondarily absorbed in Sahidic, ☞ § 5.5.9.

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baigner, *bagnier*, *baignier*, *bainier* etc. (modern French *baigner* /benʲe/). It is a fundamental rule of modern Irish orthography that no vowel sign but *e* or *i* can be written in contact with a palatal consonant or consonant cluster. For example, /bo:rʲə/ "streets" is written *bóithre* where an intrusive graphical *-i-* is inserted between the non-palatal vowel *ó* and the following palatal cluster *-thr-* (the singular form is *bóthar* /bo:r/ "street").

3.17.4 Epenthesis of Ⲓ / ⲞⲨ after a sonorant in Bohairic

Words which, according to their etymology and to the forms of other dialects, should terminate in a glide (/j/, /w/) + a nasal (Ⲙ, Ⲛ), frequently show an additional Ⲓ or ⲞⲨ respectively at the end of the word in Bohairic (cf. Lacau 1970a: 54). The phenomenon might in principle apply to sequences glide + sonorant in general, but I have no examples for sonorants other than nasals. This epenthesis is less regular for ⲞⲨ than for Ⲓ. Cf.:

- ^{b}ⲤⲎⲚⲒ, but ^{s}ⲤⲀⲈⲒⲚ "physician" < *zjnw*
- ^{b}ⲞⲨⲰⲒⲚⲒ ~ (rarely:) ⲞⲨⲰⲒⲚ, but ^{s}ⲞⲨⲞⲈⲒⲚ "light", a derivation from *wn* > ^{s,b}ⲞⲨⲰⲚ "to open" (Vycichl 1983: 231)
- ^{b}ϨⲰⲒⲘⲒ, but ^{s}ϨⲞⲈⲒⲘ "wave" < *hꜣm* < *hꜣnw*
- ^{b}ⲤⲰⲞⲨⲚ ~ ⲤⲰⲞⲨⲚⲞⲨ, but ^{s}ⲤⲞⲞⲨⲚ "to know" < *swn*
- ^{b}ⲦⲰⲞⲨⲚ ~ ⲦⲰⲞⲨⲚⲞⲨ, but ^{s}ⲦⲰⲞⲨⲚ "to rise" < *dwn*

It seems that either an additional subphonemic vowel was spoken at the end of such words (e.g. ⲤⲎⲚⲒ ['sejnĭ], ⲤⲰⲞⲨⲚⲞⲨ ['sownŭ]), or sonorants had both palatalized and velarized/ rounded allophones (ⲤⲎⲚⲒ ['sejnʲ], ⲤⲰⲞⲨⲚⲞⲨ ['sownʷ]).

This -Ⲓ/ -ⲞⲨ-epenthesis has a superficial similarity to the epenthesis of -Ⲉ after word-final sonorants in Akhmimic (☞ § 5.8.2). However it should rather be compared to the Ⲓ-epenthesis before sonorants described in the preceding section.

3.18 On subphonemic palatalization of consonants before front vowels

It is quite natural for consonants to have a somewhat palatalized articulation when preceding front vowels. A subphonemic palatalization of consonants before front vowels is especially likely to be encountered in a language where there is no phonological opposition of palatal vs. non-palatal consonants.

In Coptic the dental stop Ⲧ /t/ contrasts with the palatal stop Ϫ /c/, whereas Greek has no palatal stop. It is therefore reasonable to assume that in Greek subphonemic palatalization of τ /t/ before /i/ was stronger than in Coptic. This hypothesis is confirmed by the observation that τι /ti/ of Greek loans could be adopted as ϪⲒ /ci/ in Coptic: ὁλοκόττινος

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/holo'kottinos/ (name of a coin) is rendered as ⲗⲟⲩⲕⲟϫⲓ /lu'kɔci/ *et var.* in Bohairic.[220] This phenomenon probably also explains why Coptic created a specific letter ϯ for expressing the phonemic sequence /ti/. The exclusively Coptic sign ϯ is preferred for expressing /ti/ in native words, whereas the letter sequence ⲧⲓ ~ ⲧⲉⲓ is used 1) if word boundaries or certain types of morpheme boundaries intervene (☞ §6.4.7.1), and 2) mostly in Greek loan words. Vycichl (1990: 30) plausibly suggests that the strong palatalization of /t/ in the sequence -τι- in Greek led to the creation of a distinct letter ϯ for indicating a sequence /ti/ spoken with non-palatalized *t*. We can therefore reinterpret the graphical rule as follows: 1) Educated Copts tried to retain a specifically Greek accent in the pronunciation of Greek loan words. They distinguished Coptic /ti/ [ti] as ϯ from Greek /ti/ [tʲi] ⲧ(ⲉ)ⲓ even in writing. 2) If two different words are involved, this question cannot play a role. So one way of rendering /ti/ was enough at a word boundary and ϯ was not needed here.

In some Coptic texts (especially Lycopolitan), the Greek sequence ἱ- or εἱ- (/hi-/) is substituted by ϣⲓ- at the beginning of a word, e.g. ἱστορία "history" > ϣⲓⲥⲧⲟⲣⲓⲁ (Kasser 1980). This indicates that the Copts perceived Greek /h/ in a palatal environment as being closer to their palatal fricative ϣ /ʃ/ than to their native ϩ /h/. (Note that Greek had no /ʃ/.)

The great Demotic Magical Papyrus (edited by Griffith & Thompson 1904-09) contains numerous magical words which cannot be attributed to any specific language and are written simultaneously in Demotic as well as Greek script. Where the Greek transcription shows stops preceding the vowel *i*, the Demotic transcription frequently has additional indications of a palatalized pronunciation, e.g. (Greek) διουφια = (Demotic) *ntsywpšyᶜ*, probable intended pronunciation [dʲiupʰʲia] (Griffith & Thompson 1904-09: III, 117; cf. also Johnson 1976: 123). This again seems to indicate that, in the view of the author(s) of the text, automatic palatalization before /i/ was more prominent in the Greek than in the Demotic language.

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[220] Sahidic mostly has ϩⲟⲗⲟⲕⲟⲧⲥⲓ *et var.* (Girgis 1967/68: 67).

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4 Syllable structure and phonotactics

4.1 Three vowel classes in Coptic

As was recognized early, Coptic stressed vowels (on unstressed vowels ☞ § 5.8) can be arranged into three classes each of which has two members frequently showing morphological alternations with one another. In the following chart, the vowels are arranged by their place and manner of articulation. My assumptions about the articulation of Coptic vowels are discussed in § 5.2. The following is valid for Sahidic and Bohairic, whereas the other dialects have somewhat different representations (☞ § 5.3).

	high	low	Paleo-Coptic vowel quality (☞ § 5.5)
class 1: back	ⲱ	ⲟ	*a*
class 2: front (1)	ⲓ	ⲁ	*i*
class 3: front (2)	ⲏ	ⲉ (?)	*u*

High and low vowels of the same place of articulation are frequently found in morphophonological alternations.

Examples of ⲱ-ⲟ–alternation

- ^{s}ⲉⲓⲱⲧ /ˈjot/ “father” – ^{s}ⲉⲓⲟⲧⲉ /ˈjɔtə/ “fathers”
- ^{s}ⲥⲱⲛⲉ /ˈsonə/ “sister” – ^{s}ⲥⲟⲛ /ˈsɔn/ “brother”
- ^{s}ϩⲗⲗⲱ /hḷˈo/ “old woman” – ^{s}ϩⲗⲗⲟ /hḷˈɔ/ “old man”
- ^{s}ⲣⲱϥ /ˈrof/ “his mouth” – ^{s}ⲣⲟ /ˈrɔ/ “mouth”
- ^{s}ⲕⲱⲧⲉ /ˈkotə/ “to turn” – ^{s}ⲕⲟⲧϥ /ˈkɔtf/ “to turn him”

Examples of ⲓ-ⲁ–alternation

- ^{s}ϩⲟⲩⲉⲓⲧ /ˈhwit/ “first (sg.)” – ^{s}ϩⲟⲩⲁⲧⲉ /ˈhwatə/ “first (pl.)”
- ^{s}ⲉⲃⲓⲧ /əˈβit/ “honey dealer” – ^{s}ⲉⲃⲓⲁⲧⲉ /əβˈjatə/ “honey dealers”
- ^{s}ϯⲟⲩ /ˈtiw/ “five” – ^{s}ⲧⲁⲉⲓⲟⲩ /ˈtaju/ “fifty”
- ^{s}ⲙⲓⲥⲉ /ˈmisə/ “to give birth” – ^{s}ⲙⲁⲥⲧϥ /ˈmastf/ “to give birth to him”
- ^{s}ⲣⲓⲕⲉ /ˈrikə/ “to bend” – ^{s}ⲣⲁⲕⲧⲥ /ˈrakts/ “inclination”

The ⲏ-ⲉ–class is less well established, ☞ § 5.5.5.

4.2 Predicting the Coptic vowel class by the number of following consonants

These morphological alternations, comparable to the phenomenon of apophony in Indo-European languages, are unmotivated on the synchronic level. Vowel height cannot be predicted by the phonetic environment in Coptic. From a diachronic perspective, however, an interesting relationship becomes obvious between the height of the stressed

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vowel on the one hand and the number of consonants which followed this vowel at an earlier stage of Egyptian on the other. This rule is the following:

> THE STRESSED VOWEL IS HIGH WHENEVER EXACTLY TWO CONSONANTS FOLLOWED IT AT A PRE-COPTIC STAGE; THE STRESSED VOWEL IS LOW WHEN ONE OR THREE (I.E. AN ODD NUMBER OF) CONSONANTS FOLLOWED.

For example, ⲙⲁⲥⲧϥ "to give birth to him" goes back to *ms.t-f* which indicates that three consonants already followed the stressed vowel in Egyptian. In ⲙⲓⲥⲉ "to give birth", the stressed vowel seems to be followed by one consonant. However the Egyptian predecessor *ms.t* shows a second consonant -*t* which was lost only later.

The rule presupposes the consonantal skeleton of a stage of the language at which the consonantal losses discussed in § 3.14 had not yet taken place, i.e. approximately Middle or Old Egyptian. It is further necessary to count those consonants (mostly glides and sonorants) which can be omitted in writing ("defective writing", ☞ § 2.6.4). This leads to two important conclusions: 1) glides are actually consonants, the graphemes in question must not be interpreted as vowel indicators; 2) glides may be graphically suppressed but are nevertheless present on the phonological level of Egyptian.

This principle was first observed by STEINDORFF (1894) although he gave it a quite different formulation (☞ 4.3.2), and it has been a crucial premise of all research into Egyptian phonology since. I have undertaken an examination to determine the degree to which it actually holds true. Appendix 4 contains a list of all words found in a Middle Kingdom manuscript of the story of Sinuhe that were preserved in Coptic. My conclusion is that there is indeed a strong correlation between vowel height in Coptic and the number of formerly following consonants, although there are some exceptions. Thus I assume that the rule is basically valid, however further qualifications of the rule should be expected in the future and have actually been proposed (☞ § 4.8.6).

4.3 The "standard theory" of Egyptian syllabification

4.3.1 Basic principles

The observation presented in the preceding section calls for a phonetically plausible interpretation. It is difficult to see how the mere number of consonants following a vowel should affect its development. Rather, the number of consonants following the stressed vowel must somehow be related to a phonological feature of the stressed syllable itself. STEINDORFF (1894) first suggested that this feature is the openness vs. closeness of the stressed syllable, an assumption which has basically been accepted until the present day. The stressed syllable is assumed to be open if an even number of consonants follow and closed if an odd number of consonants follow.

In order to predict the openness vs. closeness from the number of consonants following the stressed vowel, a set of syllabification rules and related assumptions need to be

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agreed upon. More than one such set of rules would theoretically be possible. However, Egyptology has chosen one solution which has essentially remained unchanged since then. According to this scenario, it is assumed that (ignoring all segments left of the stressed syllable) all words originally had one of the following structures (| = syllable boundary):

one consonant following the stressed vowel	'CVC
two consonants following the stressed vowel	'CV: | CVC
three consonants following the stressed vowel	'CVC | CVC

This can also be expressed by the following principles:

1) The stressed syllable may end in one consonant (closed syllable) or in a vowel (open syllable) but not in a consonant cluster.
2) A posttonic syllable always ends in exactly one consonant, i.e. it must be closed.
3) A posttonic syllable always begins with exactly one consonant, i.e. a consonant cluster is always separated by a syllable boundary.
4) There were no shifts of stress during the history of the language, at least from the time at which these rules were valid until the Coptic period.

As we can see, it is necessary to assume restrictions on syllable structure only for the segments following the stressed vowel. However the first inquirers to deal with Pre-Coptic syllable structure assumed an even more rigid principle: They suggested that all unstressed syllables were closed (Sethe 1899-1902: § 16) which increased the coherence and symplicity of the theory. This implied that an even number of consonants cannot precede the stressed vowel in an Egyptian word. Where this did seem to be the case, Sethe posited the existence of a so-called prosthetic element ʾĕ (i.e. ʾə)[221] for the original state of the language in order to increase the number of initial consonants by one. However Sethe's attempts to find traces of the presumed prosthetic element in the Egyptian writing turned out to be unconvincing in many cases. So later scholars (e.g. Sturm 1934: 49-58, Fecht 1960: 4) abandoned the restriction against open syllables in pretonic position to bring reconstructed Pre-Coptic closer to the actual attested Egyptian writings, but they kept the restriction for posttonic syllables in order not to damage the system of syllable structure rules as a whole which had in the meantime become firmly established within Egyptological tradition.

4.3.2 Classical formulations of the syllable structure rules

Let us now have a look at some "classical" formulations of these principles. It should be noted that what I describe as high and low vowels is traditionally described as long and short vowels respectively (on this question ☞ § 5.2.2).

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[221] Sethe (1899-1902: I, § 9).

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In the formulation by Steindorff (1894), the basic principle, namely that the type of the stressed vowel is predictable from the number of following consonants, is very implicit, although this must have been the initial observation which led him to developing his rules. Steindorff's explanations are somewhat obscured by the fact that diachronic and synchronic interpretations are not clearly distinguished.

> "Man unterscheidet im Ägyptischen und Koptischen: 1. offene Silben, d. h. auf einen Vokal ausgehende (...) – 2. geschlossene Silben, d. h. konsonantisch endende (...). Doppelt geschlossene Silben, d. h. mit zwei Konsonanten schließende kommen im Sah[idischen] nicht vor (...). Viele Silben, die in dem vorliegenden Zustande des Koptischen offen sind, waren ursprünglich geschlossen und werden auch im Vokalismus noch als geschlossene Silben behandelt (...). – Umgekehrt waren viele Silben, die jetzt geschlossen sind, ursprünglich offen (...). Offene Silben haben einen langen, geschlossene Silben einen kurzen Vokal (...). Man beachte (...), daß diese Gesetze in dem vorliegenden Zustande des Koptischen nicht mehr streng durchgeführt sind und daß vielfach der Ausfall von alten Endungen und die Verschleifung von Konsonanten (...), die oft nicht mehr nachweisbar sind, sowie Analogiebildungen eine (vielfach nur scheinbare) Durchbrechung dieser Regeln veranlaßt haben." (Steindorff 1894: 23-25)
>
> "Jedes koptische (und wohl auch ägyptische) Wort hat nur einen Bildungsvokal, der in der letzten oder vorletzten Silbe steht. Der Ton des Wortes ruht auf dem Bildungsvokal." (Steindorff 1894: 30)

Sethe (1899-1902, I: XV) states the following, quite similar formulation:

> "Nach dem Koptischen duldete das Aegyptische ebensowenig wie die semitischen Sprachen eine Doppelkonsonanz weder im Anlaut noch im Auslaut der Silbe. Anlauten kann eine Silbe vielmehr nur mit einem einfachen Konsonanten (...). Worte, die im Koptischen mit zwei Konsonanten anzulauten scheinen, wurden mit einem Vorschlagshülfsvokal ausgesprochen (...); diesem ging nach aegyptischer Auffassung ein Aleph voran (...). Hinsichtlich des Auslautes kann im Aegyptischen eine Silbe offen (...) oder einfach geschlossen sein (...). Jedes Wort hat nach dem Koptischen nur einen vollen Vokal (...), auf dem der Ton ruht (...); er kann nur in der vorletzten und letzten Silbe stehen (...). In offener Silbe war er lang, in geschlossener kurz (...). Alle übrigen Silben des Wortes sind Nebensilben (...); wie es scheint, waren sie stets geschlossen (...)."

Edgerton (1947: 1f.) draws a strict distinction between (Sahidic-)Coptic and Egyptian which makes his formulation much clearer:

> "If the main-stressed vowel of any Sahidic word derived from a simple (not compound) Old or Middle Egyptian word is placed within the complete consonantal skeleton of its OEg [*Old Egyptian, C. Peust*] or MEg ancestor in the same relative position which it occupies in S, one of the two following statements will be found to be true in the overwhelming majority of cases:

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a) If the stressed vowel is long in S, it will be followed by exactly two consonants in OEg or MEg.

b) If the stressed vowel is short in S, it will be followed in OEg or MEg either by one consonant or by three consonants (...)."

Fecht (1960: 2) states the principles as follows:

> "1. Von (...) Ausnahmen abgesehen, steht der Hauptton eines betonten koptischen Wortes auf der letzten oder vorletzten Silbe, wenn man den aus einer älteren Sprachstufe zu erschließenden Konsonantenbestand des betreffenden Wortes wiederherstellt. – 2. In jedem so in seinem älteren Konsonantenbestand restituierten koptischen Wort ist der Tonvokal lang, wenn er in offener Silbe steht, dagegen kurz, wenn er in geschlossener Silbe steht. – 3. Ein auf die beschriebene Weise wiederhergestelltes koptisches Wort hat keine doppelt geschlossenen und keine mit Doppelkonsonanz anlautenden Silben. Der absolute Auslaut und Anlaut kann nur konsonantisch sein (....)."

4.4 The historic reality of the reconstructed Pre-Coptic stage, "Paleo-Coptic"

Coptic apophony can be reduced to a predictable phenomenon as soon as a stage of the language is considered when the principal consonantal losses had not yet taken place. It has been suggested that this stage is to be dated to the Old Kingdom (Vycichl 1935-38: 388, 1955: 269, and 1990: 175f.), or even before the appearance of the first written Egyptian sources (Sethe 1923: 196f.; similarly Gardiner 1957: 432).[222] Edgerton (1947: 3f.) recognizes the difficulties of identifying this stage with a specific historical period of Egyptian. Thus he introduces a distinct term "Paleo-Coptic" for the stage which has been in wide use since then (Schenkel 1983a: XII translates it into German as "Urkoptisch"). Fecht (1960: 4) explains one reason why Paleo-Coptic is a theoretical construct which does not necessarily have a historic reality:

> "Es ist schließlich noch zu beachten, daß die aufgestellten Akzentregeln nicht unbedingt *als Ganzes* einem historisch jemals so wirklich gewesenen Sprachzustand entsprechen müssen. Das Gesetz des konsonantischen Auslauts kann bereits außer Kraft gewesen sein, als das Gesetz der Längung bzw. Kürzung von offenen bzw. geschlossenen Tonsilben seine Wirksamkeit erlangte."

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[222] Albright (1946a: 24f.) notices that Egyptian as known from the New Kingdom cuneiform documents does not conform to the expected stage. While this has led all other scholars to fix this stage at a time prior to the New Kingdom, Albright posits it afterwards. The difficulty is that many of the consonants which predict the syllable structure were already lost by the New Kingdom, a fact Albright does admit. Albright's presentation has remained a short sketch. No detailed construction of a new syllabification theory to clarify his ideas has ever appeared.

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Schenkel (1983a: XII) defines "Urkoptisch" as follows:

> "Soweit sich die ägyptische Sprache gesetzmäßig zum Zustand der koptischen Zeit hin entwickelt hat und sofern man die Entwicklungsgesetze aus mehr oder minder disparaten Indizien erschlossen hat, kann man aus den in koptischer Zeit belegten sprachlichen Elementen Vorformen dieser sprachlichen Elemente erschließen, die in vorkoptischer Zeit einmal im Ägyptischen existiert haben sollten."

4.5 The supposed prehistory of Paleo-Coptic

Several attempts have been made to reconstruct a stage of Egyptian preceding the Paleo-Coptic stage. Since this would likely represent a very early stage of Egyptian – if at all – from which none or scarce written material would be available, doing this needs either comparative etymology or internal reconstruction. The fact must be kept in mind that the Paleo-Coptic stage is already a theoretical construct rather than an attested language.

4.5.1 Reconstructions based on comparative Afroasiatic etymology

Many scholars assume that there was a period prior to the Paleo-Coptic stage at which Egyptian had open posttonic vowels (e.g. Sethe 1923: 199-207; Vycichl 1953a and 1955: 264-269; Lambdin 1958: 181-185; Vergote 1969: 82-92 and Vergote 1973/83: Ib, §§ 65-86; Kammerzell 1991a: 190f.; Roccati 1988; Zeidler 1992: 214-221). This is based on Egypto-Semitic comparison in most cases.[223] Cf. also § 5.5.7.

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[223] The identification of the Egyptian stative conjugation with the Semitic perfective conjugation is one of the cases which led Sethe (1923: 203) and Lambdin (1958: 182f.) to posit open unstressed syllables at a Pre-Paleo-Coptic stage. This is one of the more certain identifications in the field of Afroasiatic etymology.
The Old Egyptian stative form *ꜣṯp.j* "(while) he is laden" together with its Coptic equivalent ⲟⲧⲡ "is laden" leads to the traditional Paleo-Coptic reconstruction (ˈꜣaṯpVj) (note that ‹ꜣ› was probably /r/ and ‹ṯ› was /c(^{h})/ which may go back to an earlier */k(^{h})/, ☞ § 3.11.2 and 3.9.2; *-j* is a suffix, see Kammerzell 1990). There is a vowel between the second and the third consonants in all presumable Semitic correlates (on the etymology see Schneider 1997: 194): Akkadian *rakib* "he has mounted = he rides", Biblical Hebrew *rāḵaḇ* "he mounted", Egyptian dialectal Arabic *rikib* "he mounted", (with additional final vowel:) Classical Arabic *rakiba* "he mounted". This vowel is obviously lacking in the Paleo-Coptic reconstruction. If Egyptian and Semitic are genetically related, the assumption cannot be avoided that there was once a Pre-Paleo-Coptic stage at which this vowel was present: (*ˈꜣaṯVp-).
According to the alternative syllable structure rules proposed in this book the Paleo-Coptic reconstruction would already have the medial vowel: (*ˈꜣaṯVpjV).

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4.5.2 Internal reconstruction by Fecht

The most detailed reconstruction of a Pre-Paleo-Coptic stage of Egyptian is by Fecht (1960). Remember that syllable structure can be predicted in Paleo-Coptic if the stress position and the number of subsequent consonants are given. Paleo-Coptic adheres to what Fecht calls the "Zweisilbengesetz", i.e. word stress falls on one of the last two syllables in a word. Fecht now proposes another reconstruction which is likewise predictable from the stress position and the number of following consonants. This reconstruction allows only open syllables. After the loss of all word-final vowels, which Fecht (1960: 194) assumes to have been the first development subsequent to this stage, the so-called "Dreisilbengesetz" came into force: Word stress fell on one of the last three syllables of the word. The following chart shows how both representations can be transformed into one another:

Paleo-Coptic ("Zweisilbengesetz")	Pre-Paleo-Coptic ("Dreisilbengesetz")
'CVC	'CVC(V)
'CV:CVC	'CVCVC(V)
'CVCCVC	'CVCVCVC(V)

It would be possible to consider both representations as merely alternative reconstructions or notational variants, but Fecht does not do so. He suspects a historical succession of both systems and argues that Paleo-Coptic developed from Pre-Paleo-Coptic by the loss of some of the unstressed vowels (Fecht 1960: 169f., 195-201).

4.6 The typological unnaturalness of traditional Paleo-Coptic

Paleo-Coptic is a reconstruction of an early stage of Egyptian based on 1) vowel writings of Coptic, 2) consonant writings of Earlier Egyptian, and 3) several additional assumptions, e.g. of syllabification rules (☞ § 4.3.1). If the assumptions about syllabification rules were changed, Paleo-Coptic would look different.

Paleo-Coptic as reconstructed at present seems quite typologically unnatural for a language. It is assumed that all words (and all posttonic unstressed syllables in general) terminate in a consonant. However, open syllables are generally very frequent in the world's languages, especially in word-final position. In fact, a number of languages have only words which end in a vowel (e.g. Japanese, Swahili). In many other languages, words ending in a vowel are predominant by far (e.g. Italian, Chinese, Classical Arabic, Hausa). Many more languages easily allow both vowels and consonants at the end of a word (e.g. most European languages). However, it is difficult to find languages in which all words end in a consonant.

A few languages which lack vowel-final words have been reported to exist in Australia (cf. Dixon 1980: 210-212). In Oykangand (Cape York, Australia) all native words are

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consonant-final and vowel-initial (!) (Philip Hamilton, Toronto, personal communication; cf. also Dixon 1980: 208). Old Chinese as reconstructed according to the system by Lǐ Fānggui̇̀ has exclusively consonantal syllable codas, but this approach has not gained wide acceptance (on this question see Baxter 1992: 333-336).

Fecht's reconstruction of Pre-Paleo-Coptic is particularly problematic in that it not only continues to presuppose the existence of a typologically unnatural language like Paleo-Coptic, but derives it from another pre-form with phonological characteristics which are likewise excentric: Languages in which all syllables invariably have the structure CV are rare, and unknown within the Afroasiatic frame.

We can thus conclude that the traditional syllable structure rules lead to a reconstruction of Paleo-Coptic which is highly improbable for a natural language. In the following section, I propose an alternative reconstruction of Paleo-Coptic which is more natural. We will see that, in addition to its increased naturalness, the revised reconstruction will allow for better explanations of a number of individual phonological problems in Egyptian.

4.7 A revised reconstruction of Paleo-Coptic

When the first scholars defined the syllable structure rules, they alluded to the fact that the presumed etymological background for the Coptic vowel alternations is often still present in Coptic. For example, the stressed syllable is closed in ⲥⲟⲛ "brother" whereas it is open in the morphologically related ⲥⲱⲛⲉ "sister", so the presumed reason for the apophony ⲟ – ⲱ is still apparent (Sethe 1899-1902: I, § 42). It must however be emphasized that counterexamples are easy to find in Coptic which show exactly the opposite distribution (☞ § 4.1). Thus Coptic does not prevent us from developing a contradicting theory according to which low vowels arise in open, high vowels in closed syllables. This is what I suggest here. Let us assume that the choice of high (traditionally: long) vs. low (traditionally: short) vowels depends on whether the syllable is open or closed in Paleo-Coptic, however in an opposite way than has been assumed by now:

Coptic vowels	traditional explanation	alternative explanation
ⲱ, ⲓ, ⲏ (high)	developed in open syllable	developed in closed syllable
ⲟ, ⲁ, ⲉ (low)	developed in closed syllable	developed in open syllable

This allows for a reconstruction according to which all words end in a vowel. Any traditional Paleo-Coptic reconstruction can be unambiguously transformed into the alternative one as follows:

traditional model	new model
– (☞ § 4.8.2)	'CV
'CVC	'CVCV
'CV:CVC	'CVCCV
'CVCCVC	'CVCVCCV

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The alternative reconstruction leads to different formulations of numerous synchronic and diachronic phonological rules of Egyptian. To take one simple example, I argue that word stress falls on the penult or on the antepenult in Paleo-Coptic (monosyllabics disregarded), whereas it is traditionally assumed to fall on the ultima or on the penult of a word. In many sections of this book rules are therefore presented quite differently from the way they have been formerly described.

4.8 Additional evidence concerning the revised syllable structure rules and related matters

4.8.1 Epenthetic ⲉ in Coptic

Consonant clusters are common in Coptic. We cannot, however, posit these very clusters already for Paleo-Coptic but must rather assume a strictly limited set of syllable types for that stage. A more liberal reconstruction would no longer allow us to predict the choice of the Coptic vowel type from the number of formerly following consonants. For this reason, scholars were right in suggesting that many Coptic consonant clusters are secondary and developed through the loss of Paleo-Coptic vowels. For example, a word like Coptic ⲥⲱⲧⲡ /ˈsotp/ "to choose" is derived from Paleo-Coptic (*ˈsa:ṯVp) (traditional model) or (*ˈsaṯpV) (new model) (V = vowel of indetermined quality).

Coptic often has ⲉ-vowels in the neighborhood of sonorants which seem to be largely predictable (on this issue ☞ § 5.8.2). These subphonemic vowels need not be derived from vowels of the earlier language. On the other hand, it is not a priori impossible to consider them relics of Paleo-Coptic vowels. If the latter was true, the position of ⲉ would give us a hint as to which reconstruction of Paleo-Coptic should be preferred. Let us check the evidence:

Egyptian	Coptic	new model	traditional model	Which theory is favored?
sḏm "to hear"	^{b}ⲥⲱⲧⲉⲙ	ˈsaḏmV	ˈsa:ḏVm	traditional
sḏm "to hear"	^{a}ⲥⲱⲧⲙⲉ	ˈsaḏmV	ˈsa:ḏVm	new
sḏm-f "to hear him"	^{b}ⲥⲟⲧⲙⲉϥ	ˈsaḏVmfV	ˈsaḏmVf	traditional
tms-f "to bury him"	^{s}ⲧⲟⲙⲉⲥϥ[224]	ˈtamVsfV	ˈtamsVf	new

We can see that the evidence is ambiguous. I suggest that intrusive ⲉ's in Coptic are not inherited from Paleo-Coptic and cannot favor any Paleo-Coptic reconstruction.

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[224] Beside ^{s}ⲧⲟⲙⲥϥ which is the more "regular" form presented by the grammars. Polotsky (1933: 126-128) cites around 50 examples he found of the ⲧⲟⲙⲉⲥϥ-type. Cf. also the fact that the Greek loan σαρξ "flesh" can be written ⲥⲁⲣⲉⲝ (Girgis 1967-1968: 82).

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4.8.2 The noun *r* "mouth"

The traditional reconstruction of Paleo-Coptic assumes that all independent words begin and end in a consonant. This makes it difficult to account for words that have only one consonant in Egyptian. One example is the word for "mouth": Egyptian *r*, Coptic ^{s,b}ⲣⲟ /'rɔ/. Since, according to the traditional rules, ⲟ developed in a closed syllable, and *r* is clearly at the beginning of the word, another consonant must be assumed although it was never expressed in writing (☞ § 2.6.4). Gardiner (1957: 429f.), for instance, transcribes this word as *rꜣ*.

The explanation is much simpler in the framework of the alternative system. I reconstruct ('ra) for Paleo-Coptic from which the Egyptian writing as well as Coptic ⲣⲟ can be explained easily.

4.8.3 The divine name Seth

The name of the god Seth appears in several writings:

- ‹stš› since the Old Kingdom
- ‹stj› probably since the Middle Kingdom[225], rendered as *šu-ú-ta* ~ *su-u-ta* (Edel 1948: 19f.) and perhaps also *šu-ut-ti* (Vergote 1973/83: Ib, 99; Albright 1946a: 21) in cuneiform transcriptions at the time of the New Kingdom
- ‹stẖ› since the Middle Kingdom
- ‹stḫ› since the New Kingdom (Dynasty 19)
- Finally, we have the late forms ⲤⲎⲦ (Old Coptic) and σηϑ (Greek transcription).

Based on both the cuneiform transcriptions and the Coptic and Greek writings, we must assume a Paleo-Coptic reconstruction (*'sutCV) (new) or (*'su:tVC) (traditional). If we insert the third consonant given by the Old Egyptian writing ‹stš›, we have (*'sutšV) (new) or (*'su:tVš) (traditional). The development *š* > *ẖ* can easily be explained as discussed in § 3.8.2.

But what about the forms ‹stj› and ‹stḫ›? It is well known that palatals frequently shifted to dentals in the transition from the Old to the Middle Kingdom (☞ § 3.9.7). I suggest that the phoneme sequence /t(^{h})ʃ/ could be reinterpreted as a monophonemic /c(^{h})/ which then took part in the shift /c(^{h})/ > /t(^{h})/. This explains the writing *stj* (*j* without etymological justification as an indication of a wordfinal vowel, ☞ § 3.13.2) and agrees with the cuneiform renderings. However, for *t* and *š* to be in direct contact we must reconstruct the syllable structure as /'sutʃV/ rather than as /'su:tVʃ/.

Thus, I suggest that the final consonant of *stš* (which in the Old Kingdom would be something like /'sut(^{h})xV/) was palatalized in some instances: /'sut(^{h})ʃV/ > /'suc(^{h})V/ >

---

[225] This writing is frequent from the NK on. In the Middle Kingdom, a god ‹zti› is mentioned in the Coffin Texts (de Buck 1935-1961: V 336b and 337a). An identification of this god with Seth is likely from the context but not absolutely certain.

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/'sut(^{h})V/, whereas others remained /'sut(^{h})xV/ which then evoked the writing with *ẖ*.
The late *stẖ* is more difficult to explain. The god Seth was especially propagated by the Hyksos, a foreign people of not yet determined provenance who ruled parts of Egypt during the 2nd Intermediate Period. Perhaps *ḥ* was pronounced like *ẖ* in their imperfect pronunciation of Egyptian, and this deviant pronunciation of the divine name subsequently spread to native Egyptian speakers.[226] This would conform to Roeder's (1912: 84) observation that, with few exceptions, the form *stẖ* is restricted to secular texts and the other varieties to religious texts.

4.8.4 The development of *ptr* "to see"

An etymological connection of *ptr* "to see" (since Old Kingdom) and ^{s}ⲡⲱⲱⲣⲉ, ^{b}ⲫⲱⲣ "to dream" is widely accepted today (e.g. Westendorf 1965/77: 151, Vycichl 1983: 163). Indeed, it seems practically certain since intermediate forms exist which still mean "to see" but have already lost the *-t-* (Wilson 1997: 380; see also the evidence cited by Fecht 1960: § 206). This etymology is phonetically difficult to reconcile with the traditionally reconstructed form ('pa:tVr) (emergence of a final vowel in Sahidic, unmotivated loss of *-t-*).
The derivation is easier from the reconstruction ('patrV). The cluster *-tr-* favored the retention of the final vowel. Although *-tr-* should regularly have been simplified to *-t-* rather than to *-r-* (☞ § 3.14.3), it developed to *-r-* in this verb. Analogy to other forms of the same verb in which *-r-* was regularly retained may have played a role.

4.8.5 Other evidence supporting the revised syllable structure rules

There are several more phenomena which become explicable only after our revision of the syllable structure rules and are discussed in other sections of this book: ☞ §§ 3.12.4, 3.14.2.4, 3.14.3.2, 3.16.3, 5.6.7, and 6.2.2.4.

In the present book, I do not attempt a detailed discussion of the cuneiform transcriptions of Egyptian words because of their peculiar problems. Even the earliest transcriptions show syllable structures which are already rather similar to the Coptic forms because the principal consonantal losses have already taken place. The fact is also problematic that syllable types other than V, VC, CV, and CVC cannot be adequately expressed in the cuneiform writing system. Nevertheless, I wish to mention the fact that cuneiform transcriptions sometimes show a double consonant where two consonants would have been in direct contact according to the revised reconstruction of Paleo-Coptic (and where Coptic only retains a single consonant). The only early (New Kingdom) example known to me are the transcriptions (*a-ma-an-*)*ap-pa* and (*a-ma-an-*)*ap-pí* of the toponym *ip.t*

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[226] A similar explanation is envisaged by Gunn & Gardiner (1918: 44) (ibidem note 1 is misleading, however).

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"Luxor" > ⲱⲡⲉ /ˈopə/ (Albright 1946a: 9). *ap-pa/i* is clearly easier to reconcile with my reconstruction (ˈiaptV) than with the traditional (ˈia:pVt). Several more examples of this kind appear in cuneiform transcriptions from the 1st millennium BC; some of them were collected by Edel (1980: 46) who suspects "graphisch überflüssige Silben".

4.8.6 Single words not matching the syllable structure rules

Although most words do conform to the syllable structure rules, some do not: Their Coptic reflex has a high stressed vowel although the number of consonants that followed in Earlier Egyptian is odd (e.g. *rʿ* "sun" > ^{s,b}ⲣⲏ), or there is a low stressed vowel with two following consonants (*wꜣ.t* "way" > ^{s}ⲟⲩⲟⲉⲓ, ^{b}ⲟⲩⲟⲓ). There have been four ways of coping with words like these:

- Sturm (1934: 49-58) rejects the syllable structure rules altogether.
- Sethe (1899-1901: I, passim) assumes additional consonants for the original form of these words, mostly in word-final position, which by accident were never expressed in Egyptian writing. The phenomenon of defective writing (☞ § 2.6.4) encouraged him to do so. This has been by far the favorite way of coping with the problem (cf. e.g. Edel 1955/64: § 106f.); quite a number of lexical entries in Egyptian dictionaries and grammars contain such virtual consonants which are actually never written in the original sources.
- Much more rarely, Sethe (1899-1901: I, § 344) supposes that an intervocalic consonant was geminated (long). In his opinion, a long consonant was written once but was counted double in terms of syllable structure. This method is adopted e.g. by Vycichl (1957b) and Schenkel (1990: 55).
- Although in principle sticking to the traditional rules which allow only syllables of the type -CVC in word-final position, Schenkel (1983a: 197-201 and 1990: 77) admits new syllable types (word-final -CV:C, -CVCC) for Paleo-Coptic where they seem unavoidable. This approach is accepted by Loprieno (1994: 130 and 1995: 36f.) who additionally accepts word-final -CV.

A complete rejection of the syllable structure rules (Sturm) is unacceptable since this does not explain why the correlation of Coptic vowel type and Egyptian consonantism holds true for the majority of cases. We would also lose the elegant explanation of Coptic apophony which is provided by both the traditional and the alternative syllable structure rules.

The other approaches are not much better. As argued in § 4.8.1, a free use of additional syllable types would make any Paleo-Coptic reconstruction impossible.

Most words which are left unexplained within the traditional system will likewise be exceptions in the alternative system proposed in this book. In principle, all means which have been sought to remedy the exceptions in the older system also work in the new one, but they nevertheless remain problematic.

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Both reconstructions of Paleo-Coptic are comparatively straightforward and explain most of the available evidence, though not all. A more elaborate theory of syllable structure rules which reduces the number of exceptions would be welcome. However it is not enough to simply loosen the restrictions which scholars have rightly imposed upon themselves to limit the arbitrariness of Paleo-Coptic reconstruction.

4.8.7 ‹ꜣ› to be skipped in applying the syllable structure rules?

Sethe (1899-1902: I, § 24 and 1923: 196) cites cases where he assumes that the presence of ‹ꜣ› is irrelevant for the development of the stressed vowel in Coptic if it is the third consonant counted from the end in a word. These are words in which he assumes that the stressed vowel preceded ‹ꜣ› (and thus preceded three consonants) but ended up as a high vowel (traditionally = long vowel) instead of an expected low (short) vowel. An example is

- *ḏꜣḏꜣ* "head" > $^{\mathrm{s,b}}$ϫⲱϫ

which according to Sethe is to be reconstructed as ('ḏaꜣḏVꜣ) whereas the Coptic form has to be derived from ('ḏa:ḏVꜣ). He explains this as a loss of ‹ꜣ› prior to the time at which the syllable structure rules became valid (i.e. prior to Paleo-Coptic). If this is true, this would be a serious exception to the syllable structure rules. Sethe's theory is adopted by Osing (1976a: note 48 on p. 368f., note 112 on p. 458, and note 114 on p. 460) and – for a few lexical items only – by Vergote (1973/83: Ib, § 28d) and Vycichl (1983: 221, 334).

Whereas in Sethe's wording the early loss affects ‹ꜣ› at the end of a syllable, we would assume in the framework of the alternative reconstruction that ‹ꜣ› is lost in intervocalic position and a vowel contraction results: ('ḏaꜣVḏꜣV) > ('ḏaḏꜣV) > ϫⲱϫ.

There is, however, actually no evidence for Sethe's rule. Since ‹ꜣ› is no longer present in these words in Coptic, it is not evident whether the stressed vowel originally preceded or followed it. The only way of deciding this question is to consult the syllable structure rules. In a word like *ḏꜣḏꜣ* > ϫⲱϫ the syllable structure rules predict that the stressed vowel was followed by two consonants. This means that the stressed vowel should have followed ‹ꜣ› instead of preceded it. I therefore propose the Paleo-Coptic reconstruction (ḏ[V]'ꜣaḏꜣV). There is in fact no need to assume an irregular sound development.[227]

As Sethe already admits, there are examples in which ‹ꜣ› as the third consonant counted from the end in a word is indeed relevant for the syllable structure rules. E.g.:

- *mꜣwṯ* ('miꜣVwṯV) "to think" > $^{\mathrm{s,a}}$ⲙⲉⲉⲩⲉ /'mɛ:wə/
- *wꜣḏ.t* ('waꜣVḏtV) "vegetables" > $^{\mathrm{s}}$ⲟⲩⲟⲟⲧⲉ /'wɔ:tə/

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[227] The question is relevant here as to whether an initial pretonic (ḏ[V]ꜣ-) would necessarily have formed a cluster (ḏꜣ-) to have evoked a prosthetic vowel in Coptic (*ⲉϫⲱϫ). At our present state of knowledge, this is not necessarily so. For discussion ☞ § 4.9.4.

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However there are other difficult words involving ‹ꜣ› which do present difficulties for the syllable structure rules but are not explained by Sethe's account. These are cases in which the position of ‹ꜣ› is known either because it is still preserved in Coptic (as /j/), or because it is separated from the stressed vowel by another consonant which is still preserved in Coptic. These cases are discussed in § 3.14.2.4.

4.9 Consonant clusters and syllable structure in Sahidic Coptic

4.9.1 The development of consonant clusters from Egyptian to Sahidic Coptic: General remarks

According to the principles of Paleo-Coptic reconstruction, we have to assume that Earlier Egyptian lacked syllable-internal consonant clusters following the stressed vowel (☞ § 4.3.1). To put it differently: There were no consonant clusters in the offglide of the stressed syllable nor of any subsequent syllable (including the end of a word), and there were no consonant clusters in the onset of posttonic syllables.

The generalization has usually been made that Earlier Egyptian did not admit consonant clusters in the onset or offglide of any syllable. However, aside from systematic simplicity, there is no clear evidence which excludes the possibility that Egyptian words began with consonant clusters. Zeidler (1995, notably page 234) discusses evidence from cuneiform transcriptions indicating that there were word-initial clusters of two consonants at least at the time of the New Kingdom. He tries to prove that these clusters are restricted to specific phonetic environments and thus are not original but developed as sandhi-forms through the loss of vowels in pretonic syllables. Vycichl (1990: 194) expresses a similar view. I will not discuss these problems further.

The following considerations will be limited to Sahidic Coptic. I only consider "standard" Sahidic and ignore atypical alternative writings. Furthermore, I do not discuss Greek loan words.

It is not easy to establish a complete inventory of possible syllable types even for Coptic. In many cases, it is difficult to decide whether a sonorant forms a syllable nucleus or not (☞ § 5.10.4). Furthermore, the question is disputed whether graphical consonant clusters may have been split by an unwritten reduced vowel [ə] on the phonetic surface (☞ § 2.7.5). Inventories of Sahidic syllable types have been proposed by Kasser (1991f: 211) and Loprieno (1995: 49). In the following, I discuss the issue which consonant clusters are possible at the beginning and at the end of Sahidic morphemes (i.e.: of words which are not morphologically complex from a synchronic point of view). I assume that all of these morphemes can in principle stand in isolation.

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4.9.2 Clusters at a morpheme boundary

4.9.2.1 Morpheme-initial two-consonantal clusters composed of obstruents

Stops (Ⲡ /p/, Ⲧ /t/, Ϫ /c/, Ϭ /kʲ/, Ⲕ /k/) and spirants (Ϥ /f/, Ⲥ /s/, Ϣ /ʃ/, Ϩ /h/) can be combined quite freely with one another, e.g.:
^{s}ⲔⲦⲞ /ˈktɔ/ "to turn", ^{s}ⲜⲞⲨⲢ /ˈksur/ "ring", ^{s}ⲤⲠⲞⲦⲞⲨ /ˈspɔtu/ "lip", ^{s}ⲤϬⲎⲢ /ˈskʲer/ "to sail", ^{s}ⲦⲠⲈ /ˈtpɛ/ "top", ^{s}ϢϨⲒϬ /ˈʃhikʲ/ "dust", ^{s}ϨϤⲰ /ˈhfo/ "female snake", ^{s}ϪⲔⲞ /ˈckɔ/ "to sell", ^{s}ϬϨⲞⲤ /ˈkʲhɔs/ "gazelle".

I have observed the following restrictions:

- The labials Ⲡ /p/ and Ϥ /f/ rarely occur in the first position. The only examples known two me are the two numerals ^{s}ϤⲦⲞⲞⲨ /ˈftɔw/ "four" and ^{s}ⲮⲒⲤ /ˈpsis/ "nine" as well as the ancient divine name ^{s}ⲠⲦⲀϨ /ˈptah/.
- The palatals Ϣ /ʃ/ and Ϫ /c/ are not attested in the second position. However the sequence ϢϪ- is possible, e.g. ^{s}ϢϪⲈ /ˈʃcɛ/ "grasshopper", ^{s}ϢϪⲎⲚ /ˈʃcen/ "garlic".

4.9.2.2 Morpheme-initial two-consonantal clusters containing a sonorant

Sonorants (Ⲃ /β/, Ⲙ /m/, Ⲛ /n/, Ⲗ /l/, Ⲣ /r/, [Ⲉ]Ⲓ /j/, [Ⲟ]Ⲩ /w/) are frequent in the second position after an obstruent, e.g.:
^{s}ⲔⲘⲞⲘ /ˈkmɔm/ "to become black", ^{s}ⲠⲢⲰ /ˈpro/ "winter", ^{s}ⲤⲚⲀⲨ /ˈsnaw/ "two", ^{s}ⲦⲞⲨⲰⲦ /ˈtwot/ "image", ^{s}ϢⲒⲎ /ˈʃje/ "length", ^{s}ϨⲖⲞⲈⲒⲖⲈ /ˈhlɔjlə/ "to swim", ^{s}ϬⲂⲞⲨⲢ /ˈkʲβur/ "left side".

Sonorants are also frequent in the first position before an obstruent, but there is a good possibility that they were spoken syllabic in this case (☞ § 5.10.4), e.g. ^{s}ⲢⲠⲈ /r̩ˈpɛ/ (/ˈrpɛ/?) "temple".

It is likewise difficult to estimate in which way initial clusters of two sonorants were realized. They are really common only with Ⲙ or ⲞⲨ as the first element, e.g. ^{s}ⲘⲒⲞⲔ /ˈmjɔk/ (or /m̩ˈjɔk/?) (a greeting), ^{s}ⲘⲖⲀϨ "battle", ^{s}ⲘⲢⲒⲤ "new wine", ^{s}ⲞⲨⲂⲀϢ "to become white", ^{s}ⲞⲨⲘⲞⲦ "to become fat", ^{s}ⲞⲨⲚⲞⲨ "hour". The other sonorants occur mainly as deviant writing variants, e.g. ^{s}ⲚⲘⲞ-Ϥ "in him" instead of the more common ^{s}ⲘⲘⲞ-Ϥ, ^{s}ⲂⲢⲀ "seed" instead of the more common ^{s}ⲈⲂⲢⲀ.

4.9.2.3 Morpheme-initial three-consonantal clusters

Three-consonantal clusters are rare in morpheme-initial position but nevertheless seem to occur. It is frequently difficult to decide in these cases whether or not a morpheme boundary was still synchronically recognizable in Coptic.

Coptic has many causative verbs beginning with Ⲧ-. Although this formation is no longer productive, Ⲧ- can probably still be considered a separate morpheme from a synchronic perspective. Cf.:

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- ^{s}ⲧ-ⲕⲧⲟ /ˈtktɔ/ (rare, usually ⲕⲧⲟ by cluster simplification in Sahidic and ⲧⲁⲕⲧⲟ in Bohairic) "to turn", cf. ^{s}ⲕⲱⲧⲉ /ˈkotə/ "to turn"[228]
- ^{s}ⲧ-ⲥⲉⲓⲟ /ˈtsjɔ/ "to satiate", cf. ^{s}ⲥⲉⲓ /ˈsi/ "to become satiated"
- ^{s}ⲧ-ⲥⲧⲟ /ˈtstɔ/ "to return (trans.)", cf. ^{s}ⲥⲱⲧ /ˈsot/ "to return (intrans.)"
- ^{s}ⲧ-ϩⲓⲟ /ˈthjɔ/ "to let fall", cf. ^{s}ϩⲉ /ˈhɛ/ "to fall"

These cases are not therefore likely to be good examples of morpheme-initial consonant clusters. The situation is more doubtful for ^{s}ϫⲡⲓⲟ /ˈcpjɔ/ "to blame" (cf. ^{s}ϣⲓⲡⲉ /ˈʃipə/ "to be ashamed") where ϫ is written instead of *ⲧϣ.

There is a more ancient causative formation with ⲥ- of which there are only a few examples left in Coptic which are probably no longer synchronically analysable as such:

- ^{s}ⲥ-ϩⲟⲩⲟⲣⲧ /ˈshwɔrt/ "to curse (stative)" (simplex not preserved in Coptic)
- ^{s}ⲥ-ϭⲣⲁϩⲧ /ˈskʲraht/ "to be quiet (stative)" (cf. ^{s}ϭⲣⲱϩ "to lack")
- Also ^{s}ⲥ-ϩⲓⲟⲙⲉ /ˈshjɔmə/, plural of ^{s}ⲥ-ϩⲓⲙⲉ /ˈshimə/ "woman", is a former compound the synchronic status of which is dubitable.

Finally, there remain a few words in which the complex initial cluster never contained a morpheme boundary to the best of my knowledge:

- ^{s}ⲡⲥⲧⲁⲓⲟⲩ /ˈpstaju/ "90"
- ^{s}ⲥϣϥⲉ /ˈsʃfɛ/ (but more commonly written ϣϥⲉ) "70"
- ^{s}ϣⲡⲓⲏⲧ /ˈʃpjet/ "humble"
- ^{s}ϣⲡⲗⲁⲕ /ˈʃplak/ (a measure)

4.9.2.4 *Morpheme-final two-consonantal clusters composed of obstruents*

Stops and fricatives can be combined with each other, e.g.:
^{s}ⲉⲓϥⲧ /ˈift/ "nail", ^{s}ⲗⲱⲕϣ /ˈlokʃ/ "to be weak", ^{s}ⲗⲱϫϩ /ˈloch/ "to crush", ^{s}ⲛⲕⲟⲧⲕ /n̩ˈkɔtk/ "to sleep", ^{s}ⲟⲩⲱϭⲡ /ˈwokʲp/ "to break", ^{s}ⲱⲥϭ /ˈoskʲ/ "to smear".

I have observed the following restrictions:

- ϫ is not attested in the second position.
- ⲡ and ⲕ cannot precede other stops.
- Two fricatives can only be combined in the order ϩ /h/ – ϣ /ʃ/ – ⲥ /s/ – ϥ /f/, i.e. the spirant which has a more backwards place of articulation comes first in a cluster. Compared to the corresponding Egyptian forms, metathesis has frequently taken place here. This rule is less strict in Akhmimic where the original sequence has sometimes been preserved. Examples:
  sfḫw "seven" > ^{s}ⲥⲁϣϥ /ˈsaʃf/ (instead of *ⲥⲁϥϣ), ^{a}ⲥⲁⳉϥ /ˈsaxf/ (instead of *ⲥⲁϥⳉ), *wsḫ* "large" > ^{s}ⲟⲩⲱϣⲥ /ˈwoʃs/ (Akhmimic still has ⲟⲩⲱⲥⳉ /ˈwosx/), *ꜣzḫ* "to reap" > ^{s}ⲱϩⲥ /ˈohs/ (Akhmimic still has ⲱⲥⳉ /ˈosx/).

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[228] I discuss the relationship of ⲕⲱⲧⲉ, ⲕⲧⲟ, and ⲧⲕⲧⲟ in more detail in Peust (1999).

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4.9.2.5 *Morpheme-final two-consonantal clusters containing a sonorant*

Sonorants (ⲃ /β/, ⲙ /m/, ⲛ /n/, ⲗ /l/, ⲣ /r/, [ⲉ]ⲓ /j/, [ⲟ]ⲩ /w/) are frequent before obstruents, e.g.:
^{s}ⲙⲟⲩⲗϩ /ˈmulh/ “wax”, ^{s}ⲥⲟⲉⲓϥ /ˈsɔjf/ “crazy”, ^{s}ⲥⲱⲛⲧ /ˈsont/ “to create”, ^{s}ϣⲱⲣⲡ /ˈʃorp/ “to be early”, ^{s}ϩⲱⲃⲥ /ˈhoβs/ “to cover”, ^{s}ϩⲟⲙϫ /ˈhɔmc/ “sour (stative)”, ^{s}ϭⲱⲟⲩϭ /ˈkʲowkʲ/ “to be twisted”.

All sonorants apart from ⲉⲓ /j/ and ⲗ /l/ can appear in the second position. After an obstruent, however, there is a good probability that sonorants were spoken syllabic (☞ § 5.10.4), e.g. ^{s}ϩⲱⲧⲣ /ˈhotr̩/ (/ˈhotr/ ?) “to join”.
The phonetic interpretation is likewise unclear for sequences of two sonorants, e.g. ^{s}ⲟⲃⲛ “alum” (/ˈɔβn̩/?, /ˈɔβn/?), ^{s}ⲥⲟⲟⲩⲛ “to know”, ^{s}ⲧⲁⲉⲓⲟⲩ “50”, ^{s}ⲧⲱⲛⲟⲩ “certainly” (/ˈtonu/?, /ˈtonw/?), ^{s}ⲱⲗⲙ “to embrace”, ^{s}ϩⲱⲣⲃ “to break”. On this problem ☞ § 5.9.

4.9.2.6 *Morpheme-final three-consonantal clusters*

Clusters of three consonants do not seem to be permitted at the end of a morpheme. There are a few words involving final -ⲧⲛ in which no morpheme boundary is known to have been present. But it is probable that ⲛ was pronounced syllabic here so these are not consonant clusters in the strict sense:

- ^{s}ⲛ-ϫⲟϥⲧⲛ /n̩ˈcɔftn̩/ “headlong” < *m ṯftn*
- ^{s}ⲥⲟⲟⲩⲧⲛ /ˈsɔwtn̩/ “to straighten” < *sdwn*
- ^{s}ⲟⲩⲟⲥⲧⲛ /ˈwɔstn̩/ “to broaden” < *wsṯn*

4.9.3 Clusters at a word boundary

The possibilities for consonant clusters are much more extended at a word boundary than at a morpheme boundary. For example, the personal pronominal clitics ⲕ- /k/, ⲥ- /s/, ϥ- /f/, and ⲧⲛ- /tn/ (/tn̩/), as well as the morpheme ϣ- /ʃ/ (“can”) can precede any verbal stem in Sahidic. The definite articles ⲡ- /p/ (masc. sg.) and ⲧ- /t/ (fem. sg.) can precede any single consonant, but normally no consonant cluster in Sahidic. In Bohairic and Akhmimic, they can even precede any consonant cluster. In many compounds, all vowels are elided from the first component which frequently creates word-initial clusters of three or four consonants, e.g. ^{s}ϣⲡ-ϩⲙⲟⲧ /ˈʃphmɔt/ “to give thanks” (from ^{s}ϣⲱⲡ /ˈʃop/ “to receive” + ^{s}ϩⲙⲟⲧ /ˈhmɔt/ “grace”).

Similarly, final clusters can increase when consonantal suffixes are added. The pronominal clitics -ⲧ /t/, -ⲕ /k/, -ϥ /f/, -ⲥ /s/, -ⲛ /n/ (/n̩/) and -ⲧⲛ /tn̩/ occur after verbal stems and after some nouns. -ϥ /f/ and -ⲥ /s/ are used as nominal suffixes. Many verbs have a reduplicated structure in which a vowel is elided from the second component. Final consonant clusters can then appear which violate the restrictions valid for morpheme-final clusters, e.g.:

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- ^{s}ϫⲟⲕϫⲕ /ˈcɔkck/ “to prick” (ⲕ precedes stop)
- ^{s}ⲡⲟⲧⲡⲧ /ˈpɔtpt/ “to fall away” (ⲡ precedes stop)
- ^{s}ϣⲟϥϣϥ /ˈʃɔfʃf/ “to excavate” (front spirant ϥ precedes back spirant ϣ)

Magnus (1969: 28f.) states that the sequences -CC, -CCC, and -CCV are allowed at the end of a Sahidic word, whereas -CCCC and -CCCV are not (V being an unstressed vowel).

4.9.4 Word-initial epenthetic vowel

If ‹ꜣ› is the second consonant in an Egyptian word and precedes the stressed vowel, the Coptic equivalent frequently has a secondary ⲉ- /ə/- before the first consonant. Sethe (1899-1902: I, § 9) gave the explanation that both consonants formed a *Cꜣ*- cluster during a certain period of the history of the Egyptian language, and later a prosthetic vowel was added at the beginning of the word to avoid the initial consonant cluster. However ⲉ- does not occur in all words of this structure.

As has been discussed in § 3.14.2, the consonant ‹ꜣ› can be either retained as /j/ or lost in Coptic. In the latter case, the motivation for the epenthetic vowel is no longer synchronically visible. Consequently, four different developments are logically possible for words with ‹ꜣ› as the second consonant, and all of these are actually attested:

1) ‹ꜣ› retained as /j/, with epenthetic vowel:
   bꜣk.w “servants” > ^{b}ⲉⲃⲓⲁⲓⲕ /əβˈjajk/
2) ‹ꜣ› retained as /j/, no epenthetic vowel
   ḥꜣd “pit” (since NK) > ^{s}ϩⲓⲉⲓⲧ /ˈhjit/, ^{b}ϩⲓⲧ
3) ‹ꜣ› lost, with epenthetic vowel
   kꜣš̌j “Nubian” > ^{s}ⲉϭⲱϣ /əˈkʲoʃ/, ^{b}ⲉⲑⲱϣ
   zꜣṯw “ground” > ^{s,b}ⲉⲥⲏⲧ /əˈset/
4) ‹ꜣ› lost, no epenthetic vowel
   ḏꜣḏꜣ “head” > ^{s,b}ϫⲱϫ /ˈcoc/
   mꜣq.t “ladder" > ^{b}ⲙⲟⲩⲕⲓ /ˈmuki/
   tꜣš “border” > ^{s}ⲧⲟϣ /ˈtɔʃ/, ^{b}ⲑⲟϣ

The Coptic dialects occasionally show divergent developments. For instance, the equivalent of *ḥꜣ.t* “front” is ϩⲏ in Bohairic, ϩⲏ (most frequently) ~ ϩⲓⲏ ~ ⲉϩⲏ in Sahidic, and ⲉϩⲏ (most frequently) ~ ϩⲏ in Lycopolitan.

Vergote (1959: 16f.; cf. also 1973/83: Ib, § 28c) suggests that ⲉ- only appears if the vowel of the pretonic syllable differs from the stressed vowel, assuming that ‹ꜣ› was lost earlier between equal vowels than between different vowels:

šꜣi.t “sow” (according to Vergote:) /šiꜣa:yat/ > /šꜣa:yat/ > ^{s,b}ⲉϣⲱ

qꜣb.t “breast” (according to Vergote:) /qaꜣi:bat/ > /qꜣi:bat/ > ^{s}ⲉⲕⲓⲃⲉ (however ^{s}ⲕⲓⲃⲉ exists as well)

but: *bꜣk.t* “female servant” (according to Vergote:) /baꜣa:kat/ > /ba:kat/ > ^{b}ⲃⲱⲕⲓ

Unfortunately, it is very difficult to verify whether Vergote’s assumptions about the quality of these pretonic vowels are correct.

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For clusters other than ‹ꜣ›-second, prosthetic vowels are rare. A few examples can be found in Osing (1976a: note 949 on p. 773f.). Some words beginning with ⲙ, ⲛ, or ⲗ show an initial ⲁ- in certain dialects or textual variants in Coptic which cannot be explained etymologically, e.g. *mini̯* "to land" > ^{s}ⲙⲟⲟⲛⲉ, ^{b}(ⲁ)ⲙⲟⲛⲓ; on this cf. Osing (1976a: note 140 on p. 480f. and note 490 on p. 582).

4.10 Metatheses

It is a general observation in historical linguistics that consistent rules can be less easily established for metatheses than for most other phonetic changes. Metatheses are assumed in the development of numerous Egyptian words, but being irregular sound changes, they frequently leave some doubt about the etymology. Some scholars have assumed numerous metatheses during prehistoric periods of the language in order to increase the number of Egyptian – Afroasiatic etymologies (such as Egyptian ‹sḏm› "to hear" = Semitic √*šmʕ* "to hear"). I do not discuss metatheses of this type here.

To the best of my knowledge, only two proposals for generalizations about metatheses in Egyptian have been advanced. Both of these generalizations do not apply consistently, and both of them explain only a minority of all metatheses that can be found. Hintze (1947a: 23f.) suggests that a metathesis sometimes occurs to bring consonants and vowels of similar places of articulation closer together, e.g. *stp* "to choose" > ^{s}ⲥⲱⲡⲧ (besides more frequent ⲥⲱⲧⲡ) because both ⲱ and ⲡ share a labial place of articulation. According to Loprieno (1994: 127f.), a metathesis can serve to produce a more optimal syllable structure in terms of the sonority hierarchy (elements with high sonority move towards the syllable nucleus).

I wish to add another rule which only explains a small proportion of all metatheses but applies in a remarkably consistent manner. If two spirants form a cluster in morpheme-final position, these spirants are rearranged in Sahidic so that the places of articulation proceed from back to front. This is why, for instance, Egyptian *sfḫ* "7" developed into ^{s}ⲥⲁϣϥ /ˈsaʃf/ by metathesis instead of *ⲥⲁϥϣ (for more details ☞ § 4.9.2.4.).

A detailed examination of methatheses in Egyptian, which I am not going to present here, would have to take into account the issue of relative chronology. For example, the metathesis in ^{f}ⲥⲉⲩϩⲓ /ˈsɛwhi/ as opposed to ^{s}ⲥⲁϩⲟⲩ /ˈsahu/ (or /ˈsahw/) < *sḥwr* (ˈsaḥVwrV)[229] "to curse" must have been so late that the Fayyumic change a_{low} > ⲉ before *ḥ* (☞ § 5.6.2.1) could still take place (Osing 1976a: note 41 on p. 363f.). Similarly, in ^{b}ϣⲉⲩⲛⲓ /ˈʃɛwni/ (not attested in Sahidic) < *šnw.t* the metathesis must have taken place after the syllabic *n̥* had been reanalyzed into ⲉⲛ in Bohairic (☞ § 5.10.2), because an earlier metathesis would have given rise to a form *ϣⲁⲩⲛⲓ (Osing 1976a: note 71 on p. 383-386).

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[229] 'CaCVCCV is a common formation of causative verbs in Egyptian.

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4.11 Consonantal compatibility restrictions in Earlier Egyptian

4.11.1 General remarks

Most Egyptian lexical roots contain two or three consonants. If we consider all theoretically possible bi- or triconsonantal roots which can be formed by systematically combining all available consonants, we will find that not all of these roots are actually attested. Pure accident or the deficiency of our knowledge of Egyptian are, of course, possible reasons for such lexical gaps. Some roots which would be phonetically well formed may simply not happen to have existed or may be unknown to us. However, a closer examination reveals that there are certain general restrictions on the formation of Egyptian roots which are related to the places and manners of consonantal articulation. This phenomenon is known under the term consonantal compatibility restrictions.

Consonantal compatibility restrictions are well known from the Semitic languages (especially from reconstructed Proto-Semitic) where two consonants that share the same place of articulation cannot usually co-occur within a root (cf. Greenberg 1950, Voigt 1981). Another type of consonantal compatibility restriction is found in reconstructed Proto-Indo-European where certain manners of articulation cannot coexist within a root. But the phenomenon is more prominent in Egyptian than in any of the above mentioned language stocks, and in addition, consonantal incompatibility is still a vivid and productive phenomenon at least in the earlier attested stages of the Egyptian language.

4.11.2 Previous research on consonantal incompatibility in Egyptian

There has been comparatively little research on root incompatibilities in Egyptian. The previous investigators who dealt with the topic did not give details on how they counted their data and, with the exception of Roquet, they did not restrict their examinations to a specific period of the language.

- Czermak (1931/34: 27-30) remarks that no two different consonants of the labial series (*b*, *p*, *m*, *f*) ever follow one another (with or without intervening vowel) within the boundaries of a morpheme.
- Greenberg (1950: 179-181) explains the basic principle of co-occurrence restrictions in Semitic as a restriction of homorganic consonants in a root, and he finds this principle valid for Egyptian as well. Based on their co-occurrence behavior, he concludes that 1) the consonants written ‹ṯ› and ‹ḏ› pattern together with the velars, and 2) ‹ꜣ› and ‹ꜥ› cannot in all cases have originally been laryngeals.
- Petráček (1969) remarks that ‹h› is incompatible with ‹ḥ› and ‹ꜥ› in Egyptian.
- Rössler (1971: 275-277) also examines co-occurrence restrictions in Egyptian. He discovers that ‹ꜥ› is incompatible with the dentals ‹t›, ‹d›, and ‹z› and becomes incompatible with ‹ḥ› from the Middle Kingdom on.

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- Roquet (1973b) provides a somewhat more detailed account of root incompatibilities in Egyptian. Based on the language of the Old Kingdom, he lists pairs of consonants for which there exists "incompatibilité totale" (never attested together within one root) and "incompatibilité relative" (rarely attested together within one root) respectively. He also makes a distinction based on the relative order of the two consonants concerned, which I have not attempted to do below.
- Watson (1979) counts the co-occurrence of consonants in Egyptian verbal roots. His principle results are that ‹ꜣ› patterns as a liquid, and that ‹ṯ›, ‹ḏ›, and ‹š› pattern as velars.

4.11.3 A reexamination

Together with Frank Kammerzell, I have reexamined the issue in more detail. In the following, the core data are presented, but I do not discuss the general principles which lie behind consonantal incompatibility in Egyptian. Frank Kammerzell has discussed the background of Egyptian consonantal incompatibility in Kammerzell (1998b: 119-149) (which has not yet been published; for the time being see Kammerzell 1998a: 31f.).

Our examination is based on the computerized corpus of the Coffix Text Word Index by van der Plas (1996) (for a detailed description of this corpus and our processing strategies ☞ appendices 1 and 2). This text corpus dates from the Middle Kingdom, but we have attempted to distinguish between three pairs of sounds which largely merged already in the transition from the Old to the Middle Kingdom (*s* vs. *z*, *t* vs. *ṯ*, *d* vs. *ḏ*). It is therefore to be assumed that the chart actually represents the consonantal incompatibilities as they were valid around the time of the late Old Kingdom. In the early Old Kingdom, not all of these incompatibility rules were already valid (☞ § 3.9.2). From the Middle Kingdom on, Egyptian integrated a considerable number of loan words which did not conform with these rules, and consequently the system of compatibility restrictions was obscured.

The following chart indicates all pairs of consonants for which there appears to be a strong compatibility restriction (marked as "*"). "Strong restriction" is to say that the combination is clearly disfavored, although it may occur occasionally, e.g. in a single lexical root or in a few rare or doubtful words. The decision as to whether or not a compatibility restriction exists is primarily based on token frequency. Our results will mostly, but not always be understandable to the reader from the data presented in appendix 2. In addition to these data, the following considerations have also been taken into account:

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- All individual words were checked to look for doubtful entries.[230]
- Words in the Coffin Texts index other than those of three characters' length were also checked although they have not been documented in the chart in appendix 2.
- The dictionary by **Erman & Grapow** (1926-1963) was scanned for additional words from the Old and Middle Kingdoms which happen to be missing from the Coffin Texts (problem: we cannot determine the token frequency in this case).

Three consonants (‹ꜣ›, ‹j›, ‹n›) were not found to be subject to any strong restriction (but for ‹ꜣ› ☞ § 3.11.3) and have consequently been omitted from the following chart. The consonants as listed in the chart are rendered with the conventional transcription symbols and must not therefore be interpreted as phonetic renderings.

	r	*b*	*f*	*m*	*p*	*w*	*ẖ*	*q*	*g*	*ḏ*	*ḫ*	*š*	*h*	*ḥ*	*ṯ*	*k*	*ʿ*	*d*	*t*	*z*	*s*
r	x																				
b	*	x																			
f		*	x																		
m		*	*	x																	
p		*	*	*	x																
w						x															
ẖ		*	*			*	x														
q					*	*	?	x													
g							?	*	x												
ḏ							*	*	*	x											
ḫ							*	*	*	*	x										
š							*	*	*	*	*	x									
h			*				*	*	*	*	*	*	x								
ḥ							*				*	*	*	x							
ṯ							*	*	*	*	*	*	*	*	x						
k					*	*	*	*	*	*	*	*	*		*	x					
ʿ													*		*	*	x				
d															*	*	*	x			
t		*					*	*	*	*							*	*	x		
z							*	*	*	*			?				*	*	*	x	
s													*							*	x

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[230] To give an example, the appearance of 154 attested combinations of *w* and *k* as compared to 555 expected combinations would not normally have led us to assume a "strong restriction". However a closer examination of the attestations reveals that *w* is the last consonant of nouns in 153 of these cases. Thus *-w* is likely to be explained as the nominal suffix *-w*, i.e. as a different morpheme. For *g* + *t*, appendix 2 actually lists more attestations (51) than the 39 statistically expected, however 48 of these 51 attestations pertain to the particle *grt* which is likely to be composed with the nominal suffix *-t*.

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Our results differ from Roquet's (1973b) in several points. Different decisions were sometimes made in drawing the borderline between a significant and an accidental underrepresentation concerning a specific pair of consonants. This problem cannot be simply overcome by mathematically determining the statistical level of significance, since the major problem is posed by the uncertainty of many of the input data (deciding on how to transcribe a word, or where to assume morphological boundaries, etc.). Note also that we examined token frequency whereas Roquet probably considered type frequency. Last but not least, our corpus was different from his. The most salient differences between Roquet's and our results are the following:

- Roquet does not list any incompatibilities involving *w* since he left this consonant out of consideration (cf. Roquet 1973: 112).
- We allow for the combination of *ꜥ* + *s* which Roquet (1973b: 108, 110) considers totally incompatible.[231]
- Numerous of Roquet's "relative incompatibilities" are not covered by what we term "strong restriction".
- Some of our "strong restrictions" do not even appear among Roquet's "relative incompatibilities" (*b* + *ẖ*, *b* + *t*, *h* + *ḏ*, *h* + *ṯ*, *h* + *k*, *h* + *z*, *ḥ* + *ṯ*).

4.11.4 Roots with complete or incomplete reduplication

Since two consonants that share the same place of articulation do not normally co-occur in an Egyptian root, we should expect that two identical consonants do not co-occur either. However this is not true. One of the reasons for this is the fact that a root can be reduplicated. There are many reduplicated verbs in Egyptian such as *bꜥbꜥ* "to bubble", *ptpt* "to trample", *nmnm* "to move", *gmgm* "to smash", *snsn* "to associate".

There are also several Egyptian triconsonantal roots in which the first and the third consonant are identical. A possible explanation would be that these are incomplete reduplications (cf. Greenberg 1950: 181). Examples:

- *ꜥꜣꜥ* "to ejaculate" (note that ‹ꜥ› = /d/, ‹ꜣ› = /r/)
- *ꜥḥꜥ* "to stand"
- *ḫꜣḫ* "to be speedy"
- *grg* "to establish"

It can be remarked that the second consonant in words of the type ABA is preferably a sonorant. These words were perhaps originally reduplications of the type ABAB, and

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[231] There is a common root *sꜥḥ* "dignity" which is well attested from the Old Kingdom on. Other words containing *s* and *ꜥ* are *smꜥ* "pole" (from the Old Kingdom on), *sꜥb* "to castrate" (from the Middle Kingdom on), *smꜥ* "vegetable fibre (Meeks 1977/79: II, 326; from the Middle Kingdom on) and *sḫꜥ.t* "rabbit" (from the Middle Kingdom on); for the latter three, a reading with *z* would likewise be possible, but the combination *ꜥ* + *z* is excluded according to our as well as to Roquet's minds.

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word-final B might have been lost when it was a sonorant whereas it was preserved when it was not.

Other major exceptions to the consonantal compatibility restrictions belong to a similar root type in which the first and the third consonants are not identical but in a way related. In all of the following roots, the first and the third consonants should not normally co-occur within a root:

- *bnf* "gall"
- *pnq* "to bale out"
- *ḫꜣdw* "dough"
- *ẖꜣk-ỉb* "disaffected person"
- *šnḏ.wt* "loincloth"
- *gnẖ.t* "star"
- *pꜣq* "thin"
- *ḫpš* "foreleg"
- *ẖʿq* "to shave"
- *šnṯ* "to oppose"
- *kꜣp* "to burn incense"

It is possible that at least some of these were originally (incomplete) reduplications. This would mean that the first and the third consonants were originally identical but underwent different developments with time.

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5 Vowels

5.1 Sources of information about Egyptian vowels

The Egyptian scripts do not indicate any vowels. This is also a peculiarity of most Semitic scripts. Exceptions to this principle are doubtful and very limited in Egyptian, if they exist at all (☞ § 5.4). The Egyptian scripts adhere much more to the consonantal principle than the Semitic scripts as applied to modern languages. Where modern languages (such as Arabic, Hebrew, Persian, and Urdu) are written in principally consonantal scripts, some graphemes (especially those for ‹j›, ‹w›, ‹ʔ›, ‹h›) do not have consonantal values throughout but are regularly used today for expressing vowels as well. Therefore some vowel indication regularly exists in writing these languages, although not all vowels in a word are expressed and not all vowel distinctions are shown. Additionally, both the Arabic and the Hebrew scripts have facultative vowel signs which can be added to express vowels more exactly. These additional vowel signs are not common in regular writing, however they can be used for didactic purposes or with words which otherwise would be ambiguous in a given context.

Egyptian had none of these means of vowel notation. Most modern egyptologists would agree that, e.g., the signs for glides (‹j›, ‹w›) were generally not used to write the phonetically related vowels /i/ or /u/. This is evident most clearly from the syllable structure rules as discussed in § 4.2.

Egyptian vowels are therefore only known from renderings of Egyptian in other writing systems. Coptic is by far most important of these. Furthermore, there are transcriptions of Egyptian words into Greek, cuneiform, and other writing systems. The earliest indications of Egyptian vowels are found in cuneiform transcriptions of the 14th and 13th centuries BC (New Kingdom). These early transcriptions contrast markedly with the vowels known in Coptic. Since certain regularities in the sound correspondences can be recognized, it is possible to establish some basic sound rules for the development of vowels between the New Kingdom and Coptic times and thus to stipulate the vocalization of Egyptian words which are preserved in Coptic for the time of the New Kingdom with a reasonable degree of probability. Nothing is known about Egyptian vowels for periods prior to the New Kingdom. I will not attempt to discuss them in this book.

Insight into the Egyptian vowel system is restricted by the fact that the Greek and cuneiform writing systems likewise have limited possibilities of distinguishing vowels. Greek uses seven different vowel graphemes for distinguishing vowel quality. Vowel quantity, which was phonologically distinctive in Ancient Greek, is only expressed in writing when accompanied by subphonemic differences in quality. For example, /e/ = [ɛ] and /eː/ = [eː] are distinguished as ε and η respectively, but /i/ [i] and /iː/ [iː] are indiscriminately written ι.

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Cuneiform only makes a difference between three (*a*, *i*, *u*), in some phonetic contexts between four (*e*), in rare cases between five (*o*)[232] vowel qualities. Furthermore, there is the possibility of so-called "plene-writing" which is traditionally assumed to have expressed vowel length; however, more recent research has put serious doubt on this.[233]

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[232] Westenholz (1991) argues that in the case of plene-writing ‹ú› denotes /u/ whereas ‹u› and ‹u$_4$› denote a distinct phoneme /o/ in certain Old Babylonian texts. It has not yet been clarified whether this distinction is also applied in some of those cuneiform documents in which Egyptian words are transcribed.

[233] Most cuneiform phonograms express sequences of at least one consonant and one vowel (e.g. ‹pa›, ‹ap›, ‹pap› etc.). But there are a few signs that indicate smaller units than this, which are commonly transcribed with single vowel symbols (‹a›, ‹e›, etc.). Their employment is called plene-writing. There are two different functions of plene-writing in Akkadian which have to be strictly distinguished:

1) In Old Akkadian the signs used in plene-writing seem primarily to express consonantal segments, namely glides such as /j/, /w/ and /ʔ/ (cf. Aro 1953: 3f. and Knudsen 1980: 10f.). They can occur in word-initial position; such writings continue to a certain extent into Old Babylonian but disappear later. They can also occur in intervocalic position; this possibility likewise becomes restricted in later times because other signs are developed for expressing glides, however the sign ‹a› can be used to express a glide throughout the history of Akkadian.

2) Let us now consider the second function of plene-writing, which is the most widespread one in the post-Old Akkadian period.

There can usually be no more than one plene-writing in a word. (For some rare exceptions see Hutter 1985: 13.) It is, however, possible for plene-writings in function 1) and in function 2) to co-occur. On the graphical surface, Akkadian words may behave with respect to plene-writing in at least four ways: a) plene-writing is nearly obligatory: *šu-ú* (demonstrative pronoun), b) plene-writing is facultative: *la* ~ *la-a* (negative particle), c) plene-writing is unusual but does occur: *ša* (attributive particle), with occasional *ša-a* in the *Middle Assyrian Law Code*, d) plene-writing is absent. The use of plene-writing is subject to large diachronic and geographical variation. There are some Akkadian texts, notably the Middle Assyrian Law Code, several Old Babylonian letters, and some El-Amarna-tablets (Nos. 9, 11, 41, 357; see Aro 1953: 13 and Hutter 1985: 13f.) that are known to be more favorable towards plene-writing than most other texts. Aro (1953 and 1971: 248-252) discusses these, as he puts it, "abnormal plene-writings".

Plene-writings are traditionally taken to be indicators of vowel length. Aside from plene-writing, two more criteria are traditionally employed for determining vowel quality in Akkadian, namely: 1) Semitic etymology. It must, however, be admitted that the correlation between plene-writing and long vowels in other Semitic languages is far from perfect. 2) The vowel syncopation rule, which plays a major role in Akkadian morphology, according to which certain vowels are lost whenever they would appear in an open syllable. It is usually assumed that this loss affects short vowels under the additional condition that the preceding syllable is likewise open and contains a short vowel. While the reality of the vowel syncopation rule is beyond doubt, the traditional explanation based on vowel quantity is not the only

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5.2 The interpretation of the Coptic vowel graphemes

5.2.1 Overview

All seven vowel signs of the Greek alphabet are used in Coptic: ⲁ (= Greek α), ⲉ (= ε), ⲏ (= η), ⲓ (= ι), ⲟ (= ο), ⲱ (= ω) and ⲩ (= υ). Among these, ⲩ used in isolation has a marginal status and appears mainly in Greek loanwords where it renders υ or η of the source language.

The vowel inventory of Coptic short stressed vowels can be sketched as follows:

low				ⲁ [a]			
			ⲉ [ɛ]		ⲟ [ɔ]		
		ⲏ [e]				ⲱ [o]	
high	(ⲉ)ⲓ [i]						ⲟⲩ [u]
	front						back

In addition, there is a set of long vowels which are written by doubling the vowel grapheme. For these ☞ § 5.2.3.

I do not discuss the question here which distinctions are phonologically relevant; on this issue ☞ § 5.3.

5.2.2 High vs. low vowels in Coptic

5.2.2.1 *General remarks*

The difference between ⲉ and ⲟ on the one hand and ⲏ and ⲱ on the other is traditionally understood as one of vowel quantity (e.g. Sethe 1899-1902: I, §§ 22ff.). However there is actually very little evidence for this claim. The main argument seems to be the fact that the respective Greek letters indicate vowel quantity in Classical Greek. I will argue below that the difference between the signs in question rather is one of vowel quality.

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possible one.

Aro (1953: 18 and 1971: 250) considers the possibility that at least the "abnormal plene-writings" may indicate word stress. Fecht (1960: § 72) shows that plene-writing in transcriptions of Egyptian words clearly coincides with Egyptian word stress rather than with vowel length. Knudsen (1980) argues that Akkadian plene writing in general does not indicate length but accentual pitch. He calls attention to the fact that the last syllable of a question sentence is often written plene, including words that are never written plene in other contexts (Knudsen 1980: 11). It is indeed very common for questions in languages around the world to be marked by a raising intonation at the end.

We can conclude that Akkadian plene-writing is probably related to stress or intonational features rather than to vowel quantity.

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The Coptic vowels ⲱ and ⲏ were higher in articulation than ⲟ and ⲉ. This is based on several pieces of evidence:

- the fact that ⲱ and ⲟⲩ are historically closely related, as are ⲏ and (ⲉ)ⲓ (☞ § 5.5.7)
- the fact that in the Late Coptic pronunciation, ⲏ is rendered by both *i*- and *a*-sounds and ⲉ by *a*-sounds only
- the evidence from Greek transcriptions of Egyptian or Coptic words (☞ § 5.2.2.4)
- the evidence from Coptic transcriptions of Arabic.

5.2.2.2 *Evidence in favor of the qualitative distinction*

Let us now look at the evidence showing that the Coptic vowel letters generally expressed qualitative rather than quantitative distinctions. Before outlining the discussion in the literature, I will summarize the basic arguments for the "quality hypothesis" first:

- The traditional view was based on the values the corresponding signs had in Classical Greek. However, it is doubtful that the quantitative distinction between ε, ο on the one hand and η, ω on the other was still present at the time when the Coptic alphabet was created. Secondly, even in Classical Greek, which definitely had a quantity opposition, the vowel graphemes primarily expressed vowel quality rather than vowel quantity (☞ § 5.1).
- In Bohairic, partly also in Sahidic, ⲉ and ⲟ appear before (etymological) laryngeal and pharyngeal consonants where ⲏ and ⲱ are expected from a morphological and etymological point of view (☞ § 5.6.6.2). It is difficult to understand why vowels should have been shortened in this phonetic environment, whereas a lowering of high vowels before back fricatives is a natural phenomenon.
- On the other hand, the diphthongs ⲟⲟⲩ, ⲟ(ⲉ)ⲓ and ⲁ(ⲉ)ⲓ frequently appear as ⲱⲟⲩ, ⲱⲓ and ⲏⲓ in Bohairic (☞ §§ 5.6.6.2 f.). Here as well it is implausible to assume a change in vowel quantity. Instead, a qualitative change of vowels before glides is far more natural.
- The fact that ⲏ frequently seems to express an unstressed reduced vowel [ə] before sonorants in Fayyumic (☞ § 5.10.2) supports the view that ⲏ does not denote a long vowel.
- In medieval texts which transcribe Arabic words in Coptic letters, no significant correlation between short and long vowels of Arabic and the presumed short and long Coptic graphemes ⲉ/ⲟ and ⲏ/ⲱ can be observed, although Arabic (both classical and dialectal) has distinctive vowel length. For example, ⲏ is commonly used to transcribe Arabic /i/ and /iː/ alike, whereas ⲉ renders Arabic /a/ as well as /aː/.
- Evidence from a manuscript writing Coptic in Arabic letters (Galtier 1906) points to the same direction.
- The traditional pronunciation of Late Coptic does not indicate any quantitative difference of ⲉ, ⲟ vs. ⲏ, ⲱ either.

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- The recently discovered Mesokemic dialect of Coptic writes ⲟ in most words which have ⲱ in the other dialects, and ⲏ in some of the words which commonly have ⲉ. Had these cases of interdialectal variation ⲟ~ⲱ and ⲉ~ⲏ been known earlier, scholars would probably not have come to presuppose that these graphemes give straightforward information about vowel quantity.[234]

5.2.2.3 Previous treatments of the issue

Most of the arguments summarized in the preceding section have already been expressed in the literature:

- Charles Kuentz was the first scholar to argue that Coptic ⲉ, ⲟ vs. ⲏ, ⲱ are distinguished by vowel quality rather than by quantity. He did this at a lecture delivered in Paris from which only a short abstract was published (Kuentz 1934). The only argument presented there is the fact that, according to Kuentz, vowel length was written by vowel doubling (on this ☞ 5.2.3.2), so the single vowel signs cannot likewise have expressed vowel quantity. As is noted in the publication (Kuentz 1934: 6), Kuentz' lecture was accepted favorably by the famous linguist Emile Benveniste.
- Shortly thereafter, Werner Vycichl (apud Worrell 1937: 4f. and Worrell & Vycichl 1942: 314) argues that ⲉ, ⲟ and ⲏ, ⲱ are distinguished by quality rather than by quantity. It is not known whether or not he was aware of Kuentz's proposal. Vycichl adduces two of the arguments which I have listed above: the evidence from morphological alternations and the Late Coptic pronunciation tradition. However in his later works, Vycichl returns to the traditional view (e.g. Vycichl 1990: 72-106), although he still admits that under certain conditions vowel quality could be the crucial factor for selecting the writing ⲉ, ⲟ vs. ⲏ, ⲱ (e.g. Vycichl 1954 and 1990: 239f.).
- Knudsen (1962: 36) accepts Vycichl's reasoning but adopts an intermediate standpoint: "In the Bohairic dialect the distinction between long and short vowels was probably not a distinction of quantity only but also of quality."
- Greenberg (1962) cites Kuentz' theory and discusses the issue in more detail. He adduces the morphological alternations in Bohairic and the use of ⲏ for /ə/ in Fayyumic. Greenberg also discusses three documents which transcribe Arabic words in Coptic letters (an Arabic text written in Coptic letters published by Casanova 1901 and Sobhy 1926; two Coptic texts containing a large number of Arabic loan words published by Stern 1885 and Chassinat 1921) as well as a Coptic text written in Arabic letters (Galtier 1906) and the liturgical pronunciation of Late Coptic. Greenberg finds that this evidence clearly supports Kuentz' hypothesis. I wish to add that Greenberg's conclusions are further confirmed by similar documents which he

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[234] Now, they either assume that Mesokemic shows a secondary development ("[...] la tendence, propre à ce dialecte, à abréger tous les *ō*", Vergote 1961: 245), or that vowel quantity is not identical to the corresponding Greek vowel quantity at least in this dialect ("Daß ⲟ in M [=Mesokemic] einen Langvokal darstellt, unterliegt keinem Zweifel", Mink 1995: 60).

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did not take into account (e.g. Farag 1976, Crum 1902); on the other hand, there is not a single document which consistently correlates Arabic long and short vowels with the presumably corresponding Coptic letters. Greenberg (1962: 28f.) comments on his results as follows:

> "The evidence presented here has not been intended merely as a citation of everything which favours the present thesis, while contrary indications are ignored. Almost nothing can be found to support the standard theory. No arguments were originally advanced in its favour. It was simply taken for granted. A conventional transcription of the Greek alphabet appeared to be confirmed by Sethe's theory regarding the Coptic vowel system for a period nearly a millenium earlier than the earliest written Coptic records. This theory itself is far from certain as regards the length of the vowels in open syllables. In fact the existing traditional assumption of the length of [ē] and [ō] in Coptic probably played an important rôle in drawing this conclusion about the earlier period."

- Magnus (1969: 33-40) accepts Vycichl's standpoint and concludes that the distinction of ⲉ, ⲟ vs. ⲏ, ⲱ is one of quality. In addition to Vycichl's arguments he adduces 1) the medieval transcriptions of Arabic words into Coptic (independently of Greenberg) and 2) the fact that Greek had no vowel quantity opposition any longer at the time when the Coptic alphabet was formed.
- Kammerzell (1998b: 159-162) accepts Greenberg's and Magnus's standpoint. While he adopts their interpretation of ⲟ as /ɔ/ and of ⲱ as /o/, he does not view the opposition ⲉ vs. ⲏ as a low-high distinction (/ɛ/ – /e/) but rather as a front-back distinction (/e/ – /ɨ/) because many instances of ⲏ are derived from original /u/ (☞ § 5.5) and the sound change /u/ > /e/ seems to be somewhat unnatural. While I admit the possibility that the shift /u/ > /e/ proceeded over an intermediate stage /ɨ/, the fact that ⲏ is indeed the high counterpart of ⲉ in Coptic is evidenced by conditioned phonetic alternations such as those discussed in § 5.6.2 and §§ 5.6.6.2 f.

Most Coptologists have not yet accepted these arguments. Till (1955: § 50) indeed considers the new theory "wahrscheinlich" but keeps the traditional transcription symbols *e*, *ē*, *o*, and *ō*. Vergote (1973/83: Ia, § 33f.) cites Kuentz'/ Greenberg's account but does not make a clear decision on it. Schenkel (1983a: 194f.) accepts the interpretation of the distinction ⲉ, ⲟ vs. ⲏ, ⲱ as one of vowel quality, however in Schenkel (1990: 70) he questions it again. Steindorff (1951: 29) and Loprieno (1995: 46) stick to the traditional interpretation and do not mention the alternative ideas. Hintze (1980: note 50 on page 53) dismisses Greenberg's arguments laconically as "ganz abwegig".

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5.2.2.4 *Relationship between Coptic and Greek vowel quality*

In Ancient Greek ω is commonly considered a lower vowel than ο. η was probably considerably low at least in the earlier stages of Greek since it frequently developed from original /a:/. However in modern Greek, η is spoken /i/. Although the vowel signs of the Coptic alphabet are derived from Greek, their phonetic values are obviously not quite identical to those of Greek. For example, ⲱ of Coptic words does not usually correspond to ω in Greek transcriptions of these words, but rather to υ or ου (Vergote 1973/83: Ia, § 36; Vycichl 1990: 183f.). On the other hand, Coptic ⲟ is transcribed in Greek as ω more frequently than as ο (Vergote 1973/83: Ia, § 38). Coptic ⲏ is transcribed in Greek not only by η but frequently also by ι (Vergote 1973/83: Ia, § 43; Vycichl 1990: 183f.).

5.2.2.5 *Coptic vowels in borrowings into Arabic*

Classical Arabic has six vowel phonemes: /a/, /a:/, /i/, /i:/, /u/, and /u:/. Additionally, some Egyptian Arabic dialects (including that of Cairo) have /e:/ and /o:/, which are developments from the diphthongs /ay/ and /aw/.

The *e*- and *o*-vowels of Coptic (ⲉ, ⲏ; ⲟ, ⲱ) are most commonly substituted by *a* and *u* respectively in Arabic. The choice of vowel quantity in Arabic is not linked to the presumed quantity of the Coptic vowel. Rather, quantity is chosen in a way to preserve the Coptic stress position in Arabic where stress is predictable from syllable structure patterns. For example, the Coptic toponym ⲧⲁⲙⲓⲁϯ /tam'jati/ is adopted as *Damyāṭ* /dam'ja:ṭ/ (☞ appendix 9) with long /a:/ since **Damyaṭ* would necessarily be spoken with initial stress in Arabic. The same is true for the modern pronunciation of Late Coptic. For further illustration of these principles cf. the examples in appendices 6, 8, and 9.

5.2.3 Coptic double vowels

Coptic vowel signs can occur in geminate writing. In the Sahidic dialect, we encounter ⲁⲁ, ⲉⲉ, ⲏⲏ, ⲟⲟ, and ⲱⲱ (☞ § 5.3.3). I argue that they express long vowels. In what follows I will primarily discuss the basic arguments for this claim. For more detailed observations on the distribution and etymology of Coptic long vowels ☞ §§ 5.3.3 and 5.5.10.

5.2.3.1 *Previous treatments*

Some (especially earlier) scholars might have interpreted Coptic double vowels as sequences of two distinct spoken vowels, although none of them expressed this clearly. For example, Lacau (1910) transcribes the writing ⲟⲟ as *ŏŏ*. Cf. also Sethe (1899-1902: I, § 26) and Steindorff (1951: 34f.).

Vycichl (1951: 73) assumes that following the first vowel a second, reduced vocalic element was spoken, although his view is not completely clear as well:

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> “Es handelt sich hier um *zweigipfelige* Vokale, d.i. mit Hoch-Tief-Ton, wofür die Phonetik des Somali interessante Parallelen bietet. Der phonetische Eindruck dieses flüchtigen, tieftonigen Vokales [i.e. of the second component, C.P.] war der eines Chatuph-Vokals [a term for reduced vowels from Hebrew grammar, C.P.]”.

In any case, it is evident from the Coptic stress rules (☞ § 6.1.2) that sequences such as ⲟⲟ form a single syllable.

Since double vowels develop historically through the loss of certain consonants, among them ‹ʿ› which was /ʕ/ in Later Egyptian, ‹ꜣ› which many earlier scholars interpreted as a glottal stop /ʔ/, and ‹i› which some also identify as /ʔ/, Till (1929) expressed the view that double vowels serve to indicate a postvocalic glottal consonant for which Coptic failed to develop a specific letter. According to this theory, a word like ^{s}ⲃⲱⲱⲛ “bad” < Egyptian *bin* is to be interpreted as /βoːʔn/. This has become the most wide-spread view on the topic (cf. e.g. Till 1955: § 33, Hintze 1980: 48, Hodge 1977: 932 and 1981, Vergote 1973/83: Ia, § 14, Ernštedt 1986: 117f., Loprieno 1995: 41, 44). In addition to etymological considerations, some more arguments have been adduced to corroborate this theory:

- The word *itrw* “Nile” > ^{s}ⲉⲓⲟⲟⲣ is transcribed as יְאֹר in the Hebrew Old Testament. The sign א itself is ambiguous since it can render a glottal stop /ʔ/ as well as a long vowel /oː/ in Hebrew, which would fit both interpretations of ^{s}ⲉⲓⲟⲟⲣ. The crucial element is the Masoretic punctuation which favors an interpretation as /ʔ/. The Masoretic signs are, however, little reliable as far as foreign names are concerned, since they were added many centuries after the time at which the texts were composed.
- With respect to certain morphophonological alternations in Coptic, morphemes with final double vowels are treated like morphemes with final consonants, as opposed to morphemes with final single vowels. For example, a word-final sonorant in Akhmimic is followed by a non-phonological epenthetic ⲉ [ə] if either a consonant or a double vowel precedes (☞ § 5.8.2). As a consequence, the suffix pronoun of the 1st person pl. is -ⲛ (e.g. ⲛⲉ-ⲛ “to us”) or -ⲛⲉ respectively (e.g. ϭⲛⲧ-ⲛⲉ “to find us”, ⲧⲉⲉ-ⲛⲉ “to give us”). Similarly, the Sahidic suffix pronoun of the 1st person sg. has two allomorphs: -ⲓ after a single vowel and -ⲧ after either a consonant or a double vowel. Till (1929) takes these facts as a proof that graphical double vowels are to be interpreted as a sequence vowel + consonant.
- Magnus (1969: 28f.) states that Sahidic allows the combinations -CC, -CCC, and -CCV in word-final position, whereas -CCCC and -CCCV do not occur (V represents an unstressed vowel; on the topic ☞ § 4.9.3). Double vowels cannot even precede -CCC and -CCV, which suggests that they are equivalent to a sequence VC. This argument is not completely cogent since such distributional restrictions may be rooted in earlier stages of the language but need not reflect the synchronic pronunciation of double vowels in Coptic. In fact, there is a counterexample ^{s}ϭⲣⲟⲟⲙⲡⲉ

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"dove" which is a late compound (☞ § 6.2.2.2). This word indicates that there was no synchronic restriction against the sequence double vowel + CCV, even if it was rare for etymological reasons.

- Depuydt (1985a: 131-137) examines the distribution of the two Sahidic allomorphs -ⲧⲛ and -ⲧⲏⲩⲧⲛ of the suffix pronoun of the 2nd pers. pl., the latter of them being an innovation of the Egyptian language. He states that -ⲧⲏⲩⲧⲛ is obligatory after stems ending in ⲧ or in a double vowel. The former case is easy to explain: Using the short form -ⲧⲛ after ⲧ would have likely caused confusion with the suffix -ⲛ of the 1st person pl., so the longer allomorph -ⲧⲏⲩⲧⲛ was preferred to avoid phonetic ambiguity. To account for the restriction after double vowels, Depuydt assumes that there must likewise have been a phonetic similarity of the sequences *double vowel* + ⲛ (1st pl.) and hypothetical **double vowel* + ⲧⲛ (2nd pl.). He argues that a double vowel is to be interpreted as *vowel* + /ʔ/, whereas ⲧ preceding ⲛ might have been realized with nasal plosion, i.e. without release of the oral constriction. The sequences *vowel* + *ʔ* + ⲛ and *vowel* + ⲧ *with nasal plosion* + ⲛ might have been phonetically so similar as to motivate the use of the extended form -ⲧⲏⲩⲧⲛ in this context.

  Depuydt's subtle reasoning is likewise not fully convincing. The conditions which determine the distribution of -ⲧⲛ and -ⲧⲏⲩⲧⲛ are not yet completely clear.[235] In any case, there are environments in which -ⲧⲏⲩⲧⲛ is obligatory in addition to the cases mentioned by Depuydt. For instance, -ⲧⲏⲩⲧⲛ rather than -ⲧⲛ is used after the preposition ^{s}ⲟⲩⲃⲉ "because of" (^{s}ⲟⲩⲃⲉ-ⲧⲏⲩⲧⲛ "because of you", not *ⲟⲩⲃⲏ-ⲧⲛ)[236] and after ⲧⲱⲟⲩⲛ "to raise" (^{s}ⲧⲟⲩⲛ-ⲧⲏⲩⲧⲛ "raise yourselves!", not *ⲧⲱⲟⲩⲛ-ⲧⲛ)[237].

- Ernštedt (1986: 105, 117) calls attention to the fact that two identical Coptic vowels can coalesce at a morpheme boundary (e.g. definite article ^{s}ⲡⲉ /pə/ + relative pronoun ^{s}ⲉⲧ /ət/ > ^{s}ⲡⲉⲧ /pət/) which he interprets as the reflex of a phonetic liaison phenomenon. Since double vowels do occur within a morpheme and are not simplified this way, he concludes that these double vowels must denote something principally different from a mere sequence of two identical vowels. In his view, the possibility for two identical vowel signs to appear in direct succession supports the view that the second vowel is a writing of a consonant such as /ʔ/.

  We have to remark that this is not exactly an argument against the interpretation of double vowels as long vowels which will be defended below. There are some other problems in Ernštedt's argument. First, the graphical simplification of indentical vowels at a morpheme boundary is not at all a consistent rule in Coptic, but it is found in specific combinations only. Phonetic liaison as assumed by Ernštedt was either uncommon in Coptic, or at least it was not consistently expressed in writing.

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[235] The most detailed accounts are by Vergote (1973/83: IIa, § 133 and § 138) and Ernštedt (1986: 133-147).

[236] Cf. Stern (1880: 375), Till (1928: 198), Ernštedt (1986: 146).

[237] Cf. Crum (1939: 445), Vergote (1973/83: IIa, § 133).

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Second, even if this kind of liaison had existed, it is clear that all presumed cases of coalescence at morpheme boundaries occur in unstressed syllables. This is a position in which proper double vowels did not occur, i.e. (in my interpretation) there were no long vowels anyway (☞ § 5.3.3).

5.2.3.2 Double vowels as indicators of vowel length

Charles Kuentz argued at a lecture delivered in Paris that Coptic double vowels express long vowels instead of sequences of two distinct vowels. This is published as a short abstract only (Kuentz 1934). He does not discuss Till's hypothesis that a double vowel expresses a sequence of a vowel + /ʔ/. Kuentz' main argument is that a double vowel can arise through the loss of a consonant which is not in direct contact with the vowel to be doubled (for these rules in detail ☞ § 5.5.10.2). The loss of a consonant at some place in a word can hardly evoke an epenthesis of a vowel at a distance, whereas a lengthening of the stressed vowel of the word would be more natural.

Independently from Kuentz, Śmieszek (1936: 14f.) expresses the view that double vowels indicate vowel length:

> "The symbols *ō* and *ū* [this is ⲱ and ⲟⲩ, C.P.] are sometimes doubled in Coptic, evidently in order to indicate vowel-length more clearly".

This is probably based on mere guessing, and he does not discuss the pertinent views of other scholars.

Greenberg (1962) examines the Coptic vowel system in greater detail. He draws the conclusion that double vowels most probably indicate vowel length instead of vowel clusters. Greenberg basically advances three arguments:

- The Coptic stress rules show that double vowels form a single syllabic peak (p. 25).
- In the medieval documents in which Arabic words are transcribed in Coptic letters (☞ § 5.2.2.3), double vowels are sometimes[238] employed to render Arabic long vowels, but never to render sequences of vowels and laryngal or pharyngeal consonants which do occur in Arabic (p. 27). To the cases cited by Greenberg, I wish to add the evidence of Arabic representations of (Egypto-)Coptic loan words and place names. Coptic double vowels are never rendered by laryngeal or pharyngeal consonants in Arabic, which is significant since Arabic has such sounds. Cf. the toponym Egyptian *ḏʿn.t* > Coptic ^{s}ϫⲁⲁⲛⲉ > modern Arabic *Ṣān* (note the long /aː/) (Vycichl 1983: 328). This shows that the respective consonants were lost in these words by the time they were borrowed into Arabic.
- There are fewer distinctions among double vowels than among simple vowels in

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[238] This happens comparatively rarely because these late documents are based primarily on the Bohairic dialect where double vowels are not used.

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> Coptic (☞ § 5.3.3). This agrees with the fact that many languages have fewer distinctions in long than in short vowels (p. 29).

Although Greenberg concludes that Coptic vowel doubling expresses vowel length, he does not ultimately dismiss Till's hypothesis that it rather indicates glottalic consonants (p. 29).

I wish to adduce two more arguments to support the interpretation of double vowels as indicators of length:

- Cuneiform possesses a specific sign ‹ʾ› which is commonly assumed to render a glottal stop. In the early cuneiform transcriptions of Egyptian, we would expect this sign to be used in words which have (or should have) a double vowel in Coptic. But this is not the case: e.g. the group *nꜣ-msḥ.w* "the crocodiles" > Coptic ˢⲚⲈ-ⲘⲤⲞⲞϨ is transcribed as *nim-ša-ḫu* (Lambdin 1953c), and *tꜣ.wï* "the two lands"[239] is transcribed as *ta-a-wa* (Edel 1994a: II, 372) (both from the 2nd millennium BC), although we should expect **nim-ša-ʾ-ḫu* and **ta-ʾ-wa* respectively.
- No Coptic word has more than one double vowel. In the traditional view there is no evident explanation for this fact. There is no reason why two laryngeal consonants in a word could not have been preserved from Egyptian. Assuming the alternative theory, the straightforward explanation comes to mind that long vowels occur in the stressed syllable only. This is a restriction known in many languages around the world, among them the contemporary Arabic vernacular of Egypt.

5.2.3.3 Criticism of the quantity hypothesis

The theory by Kuentz and Greenberg has been largely ignored by Coptologists. Kasser (1982b: 44) is the first scholar to have argued against it. He states that double vowels can be separated by line breaks in Coptic manuscripts, whence he concludes that there must have been a syllable boundary between both vowels. His argument, however, is not convincing as long as no systematic theory of Coptic line breaking has been developed. It is quite obvious that Coptic line breaking cannot be explained by a syllabic principle, at least unless quite complicated additional assumptions are made (such as Kasser's "bradysyllabation" for which ☞ below and § 5.9.2).

Another argument which might be adduced, although no one appears to have done so, is the fact that the numerous Greek loan words in Coptic are practically never written with double vowels although Classical Greek had phonemic vowel length. It is, however, quite possible that the opposition of vowel quantity had been abolished in Greek by the time when most Greek words were borrowed. Furthermore, there are different orthographical conventions in Coptic for native words on the one hand and for Greek loans on the other (☞ § 2.5.10). Double vowels may have been avoided in writing Greek borrowings since such writings were unfamiliar to Greek orthography.

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[239] The loss of ‹ꜣ› should have produced a double vowel in Coptic (☞ § 5.5.10.2), but no Coptic equivalent is attested (on ϨⲦⲞⲞⲨⲈ cf. Vycichl 1983: 317).

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However a double vowel is written in one early naturalized loan word from Greek: στατήρ (a weight and coin) > Demotic *sttr* > Coptic ^{s}ⲥⲁⲧⲉⲉⲣⲉ, ^{l}ⲥⲧⲁⲧⲉⲉⲣⲉ, ^{b}ⲥⲁⲑⲉⲣⲓ.

There have also been attempts to find an intermediate solution:

- Kasser (1982b, 1991d, and 1991f: 208) assumes two coexisting layers of phonological representation for Coptic, one layer for speech with normal speed ("tachysyllabation"), and another for artificially slow speech ("bradysyllabation"), the latter being the layer which formed the input for writing. He suggests that double vowels were pronounced as a disyllabic vowel sequence in bradysyllabation, but as a sequence of a single vowel + glottal stop in tachysyllabation.
- Reintges (1998) likewise suggests that there are two coexisting phonological representations. He assumes that graphical double vowels correspond to a sequence of vowel + /ʔ/ in one phonological representation, but to long vowels in another. With respect to the phonetic surface realization he says:

  > "The acoustic effect of the double association of the second rhyme position with a glottal stop and a lengthened vowel is *vowel breaking*, i.e. the re-articulation of the stressed vowel after the glottal stop /V^{ʔ}V/." (Reintges 1998: 99)

5.2.3.4 *Double vowels in other Coptic dialects*

Vowel doubling as known from Sahidic is also found in Akhmimic, Lycopolitan, and in some varieties of Fayyumic[240].

The archaic Coptic papyrus Bodmer 6 has a special letter ˆ which appears to be equivalent to ⲛ in some cases and to Sahidic vowel doubling in others. Kasser (1985: 94-101) believes that this sign has developed from a merger of three demotic graphemes, namely ‹ȝ›, ‹i›, and ‹n›. Vowel doubling in the strict sense is found as well in this text, although rather irregularly. For example, the stative of ϣⲱⲱⲧ "to cut", Sahidic ϣⲁⲁⲧ, appears as ϣⲁˆⲧ, ϣⲁⲁⲧ, and ϣⲁⲧ (Kasser 1985: 90). I suggest that ˆ should be considered a symbol for marking an additional mora. This can either mean that the vowel was spoken long, or else that it was followed by /n/; the sequence vowel + /n/ may have been realized as a (lenghthened?) nasalized vowel in certain Coptic dialects and perhaps also in the dialect of papyrus Bodmer 6 (☞ § 5.7.2).

It is difficult to see why, as Hintze (1980: 49) puts it, the existence of the sign ˆ in papyrus Bodmer 6 should "confirm" the traditional interpretation of graphical double vowels as indicators of a sequence of a vowel + glottal stop. A specific letter or diacritic for indicating the feature [+ long] in vowels is found in several writing systems: ‹h› in German, an acute accent ‹´› in Czech and Hungarian, ‹ː› in the IPA-alphabet.

The Bohairic dialect has no equivalent of double vowels at all. For this ☞ § 5.3.6.

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[240] For vowel doubling in Fayyumic cf. Kasser (1989: 99f.).

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5.3 The phonology of Coptic stressed vowels

The following description is based on native Coptic words including early borrowings. Words which were taken over from Greek are frequently written in ways which contradict the rules of Coptic phonology. It is possible that this reflects only a tendency to preserve the original Greek orthography whereas there was much more adaptation in the spoken language. But it is also possible that the Copts tried to pronounce Greek words largely according to the phonological rules of Greek. I cannot examine this question further here.

5.3.1 Coptic stressed short vowels: basic facts

According the analysis which I prefer, most Coptic dialects have six phonemes for short vowels in stressed position. While the phonological system, i.e. the relative position of single phonemes, appears to be identical in most Coptic dialects, the way of writing and possibly the phonetic realizations of the low vowels differ in what I call the conservative and the progressive dialects. The conservative dialects (Akhmimic, Lycopolitan, Fayyumic) have ⲉ and ⲁ as front and back members of the low vowels respectively, which is close to the values these phonemes had in Pre-Coptic stages of the language. By contrast, the progressive dialects (Sahidic, Bohairic) have undergone a shift towards ⲁ and ⲟ respectively:

	conservative dialects		progressive dialects (especially Sahidic, for Bohairic ☞ below)	
	front	back	front	back
low	ⲉ /ɛ/	ⲁ /a/	ⲁ /a/	ⲟ /ɔ/
mid	ⲏ /e/	ⲱ /o/	ⲏ /e/	ⲱ /o/
high	(ⲉ)ⲓ /i/	ⲟⲩ /u/	(ⲉ)ⲓ /i/	ⲟⲩ /u/

This implies that native words usually have different writings for low vowels in both dialect groups, e.g.:

^{a,l,f}ⲧⲉⲡ = ^{s,b}ⲧⲁⲡ "horn" ^{a,l,f}ⲥⲁⲛ = ^{s,b}ⲥⲟⲛ "brother"

Minimal pairs can easily be found for most of these vowel oppositions (cf. the collections of minimal pairs by Brunsch 1978: 15-57 and Magnus 1969: 14-24).

The basic correspondences as indicated here do not obtain in specific environments (☞ § 5.6). In addition, there are very rare cases in which interdialectal borrowing must probably be assumed. For example, the noun ^{a,l}ⲕⲁⲓⲉ, ^{b}ⲕⲟⲓ "field" should have an ⲟ-vowel in Sahidic. A form ⲕⲟⲓⲉ is indeed attested, however some Sahidic texts, including the writings of Shenoute, have ⲕⲁ(ⲉ)ⲓⲉ (cf. Crum 1939: 92) which seems to be a borrowing from Akhmimic or Lycopolitan. On this word ☞ also § 5.8.6.4.

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If however the Coptic "dialects" are regarded as mere different writing conventions (on this issue ☞ § 2.3), we could assume a single homogeneous phonological system instead of two. This system would look as follows:

*homogeneous Coptic

	front	back
low	/æ/	/ɑ/
mid	/e/	/o/
high	/i/	/u/

In this case, what I explained as interdialectal loans would have to be explained in a different manner. Consider also the fact that Late Bohairic ⲟ is usually substituted by /u/ rather than by /a/ in Arabic, which does not agree with a phonetic interpretation of Bohairic ⲟ as /ɑ/. So I am inclined towards the opinion that the different graphical representations of the "conservative" and the "progressive" dialects indeed reflect a phonetic difference.

5.3.2 Coptic stressed short vowels: complications

/ɔ/ is principally absent in the conservative dialects, as is /ɛ/ from the progressive dialects. Note however:

- These restrictions do not apply to long vowels, including word-final vowels, for more on this ☞ § 5.3.4.
- In unstressed position, ⲉ can be a writing of /ə/ and contrast with ⲁ in all dialects.
- ⲉ and ⲟ are commonly found in Greek loan words in all Coptic dialects.
- ⲉ is a writing for an allophone of ⲏ before back fricatives, ☞ § 5.6.2.2.
- In Sahidic, ⲉ appears before ϩ < ‹h› instead of ⲁ, but ⲁ is regularly found before ϩ < ‹ḥ›/‹ḫ›/‹ẖ›, ☞ § 3.5.2. I know only one minimal pair which is based on this phenomenon: ^{s}ⲥⲁϩⲧ-ϥ "to weave it" < *sḫt-f* vs. ^{s}ⲥⲉϩⲧ-ϥ (but also written ⲥⲁϩⲧ-ϥ) "to remove it" < *shꜣ.t-f*. Examples of ⲉ before ϩ are not numerous because ‹h› was one of the rarest consonants in Egyptian. It is possible that ϩ was treated as a syllabic sonorant and ⲥⲉϩⲧϥ was spoken ['səhtf] or ['sḥtf] rather than ['sɛhtf] (☞ § 3.5.2). Another possibility is that ϩ < ‹h› and ϩ < ‹ḥ›/‹ḫ›/‹ẖ› were still distinguished in Coptic pronunciation, so the occurrence of ⲉ vs. ⲁ would be predictable.
  In any case, if at all there was a phonological opposition between ⲁ /a/ and ⲉ /ɛ/ in Sahidic, its functional load would have been very low.
- In late Sahidic, and generally in Bohairic, ⲉ appears as a secondary development from syllabic sonorants: ^{s}ⲕⲗⲗⲉ ['kl̩ə] ~ ^{s}ⲕⲉⲗⲉ ['kɛlə] or ['kələ], ^{b}ⲕⲉⲗⲓ ['kɛli] or ['kəli] "lock". A possible phonological representation of both would be /'kalə/ since ⲁ cannot appear in this environment, ☞ § 5.10.7.
- ⲉ is occasionally found as a graphical variation of ⲉⲉ /ɛ:/ in Sahidic: ⲛⲉⲉϥ ~ ⲛⲉⲉⲃ ~ ⲛⲉⲃ /'nɛ:f/ "sailor". Similarly, ⲟ can occasionally be an imprecise rendering of ⲟⲟ /ɔ:/ in Akhmimic, e.g. ⲧⲟⲟⲧ ~ ⲧⲟⲧ /'tɔ:t/ "my hand".

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If the opposition between ⲉϩ and ⲁϩ is taken seriously and ⲉ and ⲁ are analyzed as distinct phonemes in Sahidic, the phonological system looks as follows:

Sahidic
(alternative analysis)

	front	back
low	ⲁ /a/	
mid-low	ⲉ /ɛ/	ⲟ /ɔ/
mid-high	ⲏ /e/	ⲱ /o/
high	(ⲉ)ⲓ /i/	ⲟⲩ /u/

The distribution of ⲱ /o/ and ⲟⲩ /u/ is largely, but not completely, predictable by the environment (☞ § 5.5.7). This is true of all Coptic dialects. Minimal pairs are rare but do exist, cf.:

- ^{s}ⲣⲱϩⲉ /ˈrohə/ "to wash" – ^{s}ⲣⲟⲩϩⲉ /ˈruhə/ "evening"
- ^{b}ϫⲱⲗ /ˈcol/ "to roll" – ^{b}ⲥⲧⲁ-ϫⲟⲩⲗ /staˈcul/ "spider" (on this word see Meeks 1994: 208)

It is possible to consider /o/ and /u/ distinct phonemes based on such minimal pairs. It is also possible to analyze [o] and [u] as allophones of a single phoneme, which would simplify certain morphological rules. If the latter analysis is chosen, then the vowel system of Sahidic is as follows:

Sahidic
(alternative analysis)

	front	back
low	ⲁ /a/	
mid	ⲏ /e/	ⲟ /ɔ/
high	(ⲉ)ⲓ /i/	ⲱ~ⲟⲩ /u/

5.3.3 Coptic long vowels

As was argued in § 5.2.3, long vowels are written by doubling the vowel letter in Coptic.

The phonological character of vowel length can be demonstrated by minimal pairs such as:

- ^{s}ⲁϥ /ˈaf/ "flesh" – ^{s}ⲁⲁϥ /ˈaːf/ "to do it",
- ^{s}ϣⲱⲧ /ˈʃot/ "merchant" – ^{s}ϣⲱⲱⲧ /ˈʃoːt/ "to cut",
- ^{s}ϣⲱⲛⲉ /ˈʃonə/ "to be ill" – ^{s}ϣⲱⲱⲛⲉ /ˈʃoːnə/ "to exclude".

Altogether, long vowels appear much more rarely than short vowels. I estimate the ratio of long vs. short vowels to be found in an average Sahidic text as approximately 1 to 10, if Greek loan words (where vowel length is not written), unstressed and word-final vowels (where vowel quantity is not distinctive), and syllabic sonorants are excluded from the calculation.

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Note the following important occurrence restrictions:

- Long vowels are found in the stressed syllable of a word only.
- The vowel quantity opposition is neutralized in word-final position (☞ below).

The inventory of long vowels is not exactly equivalent to the inventory of short vowels:

- In all dialects, there are probably less (certainly not more) quality distinctions for long than for short vowels, at least as far as we can conclude from the writing.
- A contrast between ⲏⲏ and (ⲉ)ⲓ(ⲉ)ⲓ is nowhere to be found. Akhmimic has ⲓⲉⲓ, the other dialects have ⲏⲏ only, cf. ^{s}ⲙⲏⲏϣⲉ, ^{a}ⲙⲓⲉⲓϣⲉ "crowd".[241]
- Also, a contrast between ⲱⲱ and ⲟⲩⲟⲩ is nowhere to be found. Akhmimic has ⲟⲩⲟⲩ, the other dialects have ⲱⲱ only, cf. ^{s}ⲃⲱⲱⲛ, ^{a}ⲃⲟⲩⲟⲩⲛⲉ "evil".[242]
- ⲱⲱ can appear as a graphical variety of ⲟⲟ in Akhmimic, but ⲟⲟ is more frequent (cf. Till 1928: 26).
- Most Coptic dialects seem to contrast ⲉⲉ /ɛ:/ – ⲁⲁ /a:/ – ⲟⲟ /ɔ:/ which has no equivalent among the short vowels. The interdialectal correspondences are complex and little researched. Consider the following examples from Sahidic:

  ^{s}ⲃⲉⲉⲃⲉ /ˈβɛ:βə/ "to bubble" – ^{s}ⲃⲁⲁⲃⲉ /ˈβa:βə/ "to be insipid" – ^{s}ⲃⲟⲟⲃⲉ /ˈβɔ:βə/ "bad (fem.)"

  ^{s}ⲉⲉⲧ /ˈɛ:t/ "to be pregnant" – ^{s}ⲁⲁⲧ /ˈa:t/ "to make me" – ^{s}ⲟⲟⲧ /ˈɔ:t/ "to be furious"

  Cf. the Akhmimic equivalents:

  ^{a}ⲃⲉⲃⲉ (probably imprecisely for *ⲃⲉⲉⲃⲉ) "to bubble" – ^{a}ⲃⲁⲁⲃⲉ "to be insipid"

  ^{a}ⲉⲉⲧ "to be pregnant" – ^{a}ⲉⲉⲧ "to make me"

  Where Sahidic has ⲟⲟ, Akhmimic can have either ⲁⲁ or ⲟⲟ, a rule is not known.[243] Cf.:

  ^{s}ⲧⲟⲟⲧ, ^{a}ⲧⲟⲟⲧ "my hand"

  ^{s}ⲃⲟⲟⲛⲉ, ^{a}ⲃⲟⲟⲛⲉ "evil (fem.)"

  ^{s}ⲉⲗⲟⲟⲗⲉ, ^{a}ⲉⲗⲁⲁⲗⲉ "grape"

  ^{s}ⲟⲩⲟⲟⲃ, ^{a}ⲟⲩⲁⲁⲃⲉ "to be clean (stative)"

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[241] The few examples of (ⲉ)ⲓ(ⲉ)ⲓ in dialects other than Akhmimic do not denote a long vowel. E.g. ^{s}ϩⲓⲉⲓⲧ "pit" < Demotic *hyt* < Egyptian *ḥ3d* (since NK) is probably /ˈhjit/; ^{s}ϫⲓⲉⲓⲣⲉ "rod" of uncertain etymology must be trisyllabic /ciˈirə/ since there is a double vowel even in Bohairic: ^{b}ϫⲓⲓⲣⲓ, variant writing ^{b}ϫⲓⲛⲓⲣⲓ.

[242] ⲟⲩⲟⲩ in ^{s}ⲙⲟⲩⲟⲩⲧ "to kill" and ^{s}ⲛⲟⲩⲟⲩϩ "to turn" is to be interpreted as /uw/, as is evident both from the etymology (*mwt*, *nwḥ*) and from the status pronominales of these verbs (ⲙⲟⲟⲩⲧ- /ˈmɔwt/-, ⲛⲟⲟⲩϩ- /ˈnɔwh/-).

[243] The rule given by Lacau (1970c: 72) that ⲟⲟ appears in closed, ⲁⲁ in open syllables does not hold true. Cf. Osing (1976a: note 39 on p. 363) who cannot offer a clear explanation either.

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We can conclude that most Coptic dialects have five long vowel phonemes:

	Akhmimic		Sahidic	
	front	back	front	back
low	ⲁⲁ /a:/		ⲁⲁ /a:/	
mid	ⲉⲉ /ɛ:/	ⲟⲟ ~ ⲱⲱ /ɔ:/	ⲉⲉ /ɛ:/	ⲟⲟ /ɔ:/
high	ⲓⲉⲓ /i:/	ⲟⲩⲟⲩ /u:/	ⲏⲏ /e:/	ⲱⲱ /o:/

5.3.4 Coptic stressed vowels in word-final position

The quantity opposition is neutralized in word-final position. Vowels in this position are treated as short vowels in certain respects but as long vowels in others:

- Word-final stressed vowels are written with single letters as are short vowels.[244]
- Certain early Sahidic texts generally write stressed word-final vowels double when the enclitic copula ⲡⲉ, ⲧⲉ, ⲛⲉ "is, are" follows.[245] They are obviously conceived as word-internal long vowels then.
- In Akhmimic, the inventory of stressed vowels in word-final position equals that of long vowels, not that of short vowels. Thus there is word-final -ⲟ (which can alternatively be written -ⲱ, see Nagel 1991: 22), but not -ⲏ.
- In Sahidic, the inventory of stressed vowels in word-final position is neither identical to the system of word-internal short nor to that of long vowels. There is an opposition ⲏ — (ⲉ)ⲓ as is the case for short vowels, e.g. ^{s}ⲣⲏ "sun" (= ^{a}ⲣⲓ) — ^{s}ⲣⲓ "cell". The opposition ⲱ — ⲟⲩ is doubtful, cf. ^{s}ⲁⲗⲱ /aˈlo/ "rope" (= ^{a}ⲁⲗⲟⲩ) — ^{s}ⲁⲗⲟⲩ "child", where it is not clear whether ⲁⲗⲟⲩ stands for /aˈlu/ or for /ˈalu/. ⲉ is clearly distinct from ⲁ, which is reminiscent of the system of long vowels: ⲛⲉ "for you (fem.)" – ⲛⲁ "to be merciful".

Vowel phonemes in word-final position:

	Akhmimic		Sahidic	
	front	back	front	back
low	ⲁ /a(:)/		ⲁ /a(:)/	
mid	e /ɛ(:)/	o ~ w /ɔ(:)/	ⲉ /ɛ(:)/	ⲟ /ɔ(:)/
			ⲏ /e(:)/	ⲱ /o(:)/
high	(ⲉ)ⲓ /i(:)/	ⲟⲩ /u(:)/	(ⲉ)ⲓ /i(:)/	(ⲟⲩ /u(:)/)

Consider the following minimal pairs from Sahidic:
^{s}ϣⲓ "to measure" – ^{s}ϣⲉ "to go" – ^{s}ϣⲁ "to rise" – ^{s}ϣⲟ "one thousand" – ^{s}ϣⲱ "sand";
^{s}ϩⲓ "to thresh" – ^{s}ϩⲏ "front" – ^{s}ϩⲉ "manner" – ^{s}ϩⲟ "face" – ^{s}ϩⲱ "to suffice".

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[244] Single exception: ^{s}ⲱⲱ "to conceive".

[245] Polotsky (1957a: 348f.), Quecke (1984a: 44), Vycichl (1990: 199, 235f.).

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We can conclude that word-final stressed vowels are neutral with respect to vowel quantity, but in Akhmimic especially they show more resemblances with long than with short vowels.[246]

There is a similar phenomenon in Cairene Arabic. Cairene Arabic has an opposition between short and long vowels. In word-final position, only short vowels appear. However these phonetically short vowels can be interpreted as underlyingly long since they are generally spoken long as soon as clitics are added to the word. Most of these vowels go back to long vowels or disyllabic groups of Classical Arabic. Cf.:

- '*nisi* "he forgot" (< Classical Arabic *nasiya*), but *ni'si:-t* "I forgot";
- '*ga:bu* "they brought" (< Classical Arabic *ǧa:bu:*), but *ga'bu:-ni* "they brought me";
- '*ʕala* "upon" (< Classical Arabic *ʕala:*, written على ‹ʿly›), but *ʕa'le:-k* "upon you".

5.3.5 The vowel system of Mesokemic

Vowel graphemes are not doubled in the Mesokemic dialect of Coptic. Instead, vowel doubling of the other dialects is reflected by the use of specific letters in two cases. It is unknown whether this was just the way to express long vowels in Mesokemic (which would then be an imitation of the usage of Classical Greek), or whether the vowel quantity distinction was lost as such but had been (partially) replaced by quality distinctions. Cf. the following correspondences (Mink 1995: 60, 62):

Sahidic	ⲁ	ⲁⲁ, ⲉⲉ	ⲏ	ⲟ	ⲱ	ⲱⲱ
Mesokemic	ⲉ	ⲏ	ⲏ	ⲁ	ⲟ	ⲱ

5.3.6 The vowel system of Bohairic

In Bohairic, there is no vowel doubling either. For example, Sahidic (ⲙ-)ⲙⲁⲩ /'maw/ "there" and ⲙⲁⲁⲩ /'ma:w/ "mother" are indiscriminately reflected as ⲙⲁⲩ in Bohairic. Certain scholars (e.g. Loprieno 1995: 41, Reintges 1998: 98f.) consider this a purely graphical merger. However the vowel quantity distinction as evidenced by vowel doubling is not usually reflected in Late Coptic or in Coptic borrowings into Arabic (☞ § 5.2.2.5), although it could easily have been maintained since both classical and vernacular Arabic distinguish short and long vowels. Thus I assume that the vowel quantity distinction was indeed lost from spoken Coptic. This is first observable in the Bohairic dialect but must then have spread on the language as a whole.[247]

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[246] Since most scholars assume that double vowels express a sequence /Vʔ/ rather than /V:/ (☞ 5.2.3.1), they have to find a different interpretation. For this reason, Hintze (1980: 49) and Loprieno (1994: 128-130 and 1995: 49f.) assume that all words with orthographic final vowels have a word-final glottal stop on the phonological level.

[247] Some of those scholars who favor the traditional interpretation of the double vowels conclude that not vowel length but the glottal stop was lost from Bohairic, e.g. Till (1929: 195), Vergote (1973/83: Ib, §§ 28i, 29), Kasser (1982b: 52).

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Differently from Mesokemic, Bohairic shows no indication that the quantitative distinction was replaced by a qualitative distinction.[248] It is of course possible that some kind of secondary qualitative distinction developed which failed to be expressed in writing. If we ignore this possibility, we can reconstruct the Bohairic vowel system as follows:

Bohairic

	front	back
low	ⲁ /a/	
mid-low	ⲉ /ɛ/	ⲟ /ɔ/
mid-high	ⲏ /e/	ⲱ /o/
high	ⲓ /i/	ⲟⲩ /u/

Cf. the following near-minimal pairs:

ϣⲓⲣⲓ "little" – ϣⲏⲣⲓ "son" – ϣⲉⲣⲓ "daughter" – ϣⲁⲣ "skin" – ⲥⲟⲣ- "to scatter (status pron.)" – ⲥⲱⲣ "to scatter" – ⲥⲟⲩⲣⲓ "thorn".

The Sahidic equivalents are ϣⲓⲣⲉ – ϣⲏⲣⲉ – ϣⲉⲉⲣⲉ – ϣⲁⲁⲣ – ⲥⲟⲣ – ⲥⲱⲣ – ⲥⲟⲩⲣⲉ.

5.4 Possible cases of vowel representation in indigenous Egyptian writing

5.4.1 Matres lectionis?

In the consonantal script systems of Hebrew and Arabic, some consonantal signs, especially those for semivowels, can also be used to express certain vowels (serving as so-called matres lectionis). While the earlier Egyptologists did interpret certain Egyptian signs as vowel indicators, the fact is now generally agreed upon that the Hieroglyphic script is principally consonantal and matres lectionis do not exist (☞ § 5.1). Nevertheless, it is still occasionally argued that certain signs might represent vowels at least during certain periods. For example, SCHENKEL (1994b: 13) suggests that 𓏭 can denote a morpheme- or wordfinal posttonic vowel /i/ (☞ § 2.6.3.2). Cf. also SCHENKEL (1999).

While these cases are questionable and certainly marginal, it is more probable that matres lectionis were used in Demotic and in contemporaneous (Graeco-Roman) hieroglyphic texts (cf. OSING 1998: I, 40f., SCHENKEL 1994c: 295, SETHE 1927). This question has been little researched, and I will not discuss it further.

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[248] For a presumed exception ☞ note in § 5.6.6.3.

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5.4.2 So-called "group writing" or "syllabic orthography"

In the New Kingdom specialized graphemes are used for representing words of foreign, primarily Semitic, origin. Some scholars have argued that these graphemes may also indicate vowels, but this theory remains very doubtful.

5.4.2.1 *The historical background of group writing*

It was shown in § 3.14 that the phonemic correlates of certain graphemes such as ‹j›, ‹ꜣ›, ‹w›, ‹t›, and ‹r› had frequently been lost by the time of the New Kingdom. The effects of this loss in the written language were essentially twofold: On the one hand, the corresponding graphemes could simply be omitted. This is to say that the written language simply copied changes of the spoken language. On the other hand, the graphic surface could more or less be kept as it was. This is to say that the phonetic values of the graphemes were reinterpreted in order to minimize changes in the written language. We can observe that the Egyptians on the whole preferred the second solution.

The grapheme ‹t›, for instance, was written quite consistently before approximately the mid of the 2nd millennium BC. From this time on, its writing became unstable: ‹t› was omitted in numerous cases and written where it is etymologically unexpected in others. We conclude that the corresponding phoneme /t(^{h})/ had been lost in certain positions by that time, and ‹t› was henceforward employed as a grapheme lacking a clear-cut sound value. New writings such as ‹ti͗› or ‹tw› were created to unambiguously render the sound /t(^{h})/ when it was still spoken. This had become possible since the phonological correlates of ‹i͗› and ‹w› themselves had frequently become lost and the corresponding graphemes had therefore lost their phonographic value. Eventually in Demotic, the successor of the group ‹ti͗› paleographically merged into a single sign which became a standard grapheme for expressing spoken /t(^{h})/ (☞ § 5.4.2.4). A comparable situation is found in modern French where both ‹t› and ‹e› are not usually articulated in word-final position, whereas the combination ‹te› corresponds to spoken /t/.

5.4.2.2 *The system of group writing in Late Egyptian*

In order to represent a single consonant phonographically in the New Kingdom there existed two possibilities, namely to continue using the grapheme of the traditional orthography, or to use one of the newly developed grapheme groups (hence "group writing"). Each of these groups consisted of two or more single signs, some of which, due to the phonetic evolution, had lost their phonetic value when appearing in isolation. Such groups were created even for consonants that were never lost in pronunciation. This led to the development of (at least) two subsets within the writing system of the New Kingdom.[249]

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[249] For rare incidences of group writing prior to the New Kingdom see HOCH (1994: 487-498).

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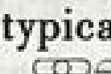
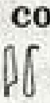
These two subsets of phonograms involve a rather clear functional difference. While native words continued to be written primarily by the traditional signs, group writing became the typical means of writing foreign words, mainly of Semitic origin. This concerns loan words which had been integrated into the Egyptian language as well as mere transcriptions of foreign place and proper names. ☞ also § 2.5.10.

There are two methodological problems with group writing.

- To date, phonograms of Later Egyptian have always been divided into two classes, viz. traditional and group writing. However this seems to be an oversimplification. I suggest that a more complex classification of Egyptian graphemes is necessary to correctly understand group writing. The problem can however not be treated in detail here.

  Certain graphemes are prototypical of group writing, i.e. their use is largely restricted to foreign words (e.g.  /t/). On the other hand, some graphemes are rarely employed as phonograms in words in which another consonant is expressed in group writing: their use is largely restricted to native words (e.g. /t/). But moreover there are graphemes which can be used freely in both native and foreign words, i.e. they can freely co-occur with group writing graphemes as well as with traditional graphemes (e.g.  /t/). They constitute a third class of graphemes which should be described as neutral with respect to group writing.
- The rules for using group writing are not strict. Group writing can sometimes be found with indigenous words, while some obvious Semitic loans of the New Kingdom are only known in conventional writing. On this topic see Ward (1957 and 1996: 39-46) and Junge (1996: note 4 on page 53). However many of the examples cited may become explicable if a more complex view on group writing is adopted as I have proposed above.

Frequently more than one graph is used in group writing to express a given consonant. Three explanations are possible here:

1) There is no functional difference: the graphs are allographs expressing a single phoneme.
2) In one case at least, it is known that group writing had a sign for a consonant which could not unambiguously be expressed in traditional writing (/l/, ☞ § 3.11). It is possible that other group writing graphemes expressed consonantal differences unknown to the traditional writing system, e.g. for expressing certain foreign sounds which were not needed when writing native words.
3) Some scholars have suggested that group writing graphemes express CV-syllables rather than single consonants, which led to the alternative labelling "syllabic orthography". It is argued that there was a particular need of vowel notation in writing foreign words and names. All attempts made to explain group writing as a syllabic script have presupposed that three vowel qualities, namely /a/, /i/, and /u/, were distinguished.

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The identification of possible vocalic values for group writing signs is hampered by several factors: 1) The identification of names in Egyptian documents with names known from non-Egyptian sources relies heavily on the conceptions the author already has regarding the phonetic values of the signs in question. 2) The sources are very heterogeneous and so are the languages from which the names might originate. 3) Most transcriptions are likely to originate from North-Western Semitic languages which are known to have been very innovative with respect to their vowel systems. This creates uncertainty as to whether one should assume vowels as known in historical languages such as Biblical Hebrew, or as reconstructed for Proto-Semitic. 4) It is further disputed whether or to which degree polyphony should be accepted.

5.4.2.3 The history of group writing research

- The fact that Egyptian of the New Kingdom had distinct conventions for writing Semitic loan words already came to the attention of Hincks (1848: 139). It was Erman (1876), the main proponent in favor of the principally consonantal nature of the Egyptian writing system, who first suggested that this writing system had been created as a device for rendering vowels in words of Semitic origin. Erman also assumed that the Egyptian scribes invented groups for writing specific Semitic consonants which were alien to Egyptian; this interesting idea has not been adopted by subsequent scholars (with the exeption of /l/). Müller (1893: 58-91) introduced the term "syllabische Orthographie" and adopted a cuneiform-like transcription system with syllables separated by dashes. Albright (1934a) tried to maintain the syllabic interpretation of group writing based on a data base which had meanwhile become much larger; he had to assume polyphony to a certain degree (p. 31f.) as well as diachronic changes of the principles of syllabic orthography ("corruptions" in his terminology, p. 14f.). His reconstructions frequently generate polysyllabic words largely composed of open syllables which do not conform with the common opinions concerning Late Egyptian syllable structure.
- Some scholars assumed that only a few groups expressed specific vowels whereas most groups were ambiguous as to vowel indication (e.g. Erman 1933: §§ 32-38; Edel 1966: 61-64, 87f.; Vycichl 1990: 211f.). Edel proposed that the only vowel expressible in group writing is /u/ which is often represented by ‹w› 𓅱 (not, however, by ‹w› 𓏲 which is commonly considered a mere graphical variety thereof), unless in word-final position. The only other groups which Edel considers unambiguous vowel indicators are 𓏤𓂓 for /ku/ (as a replacement of *𓅱𓎡 which is not a common combination in group writing, Edel 1966: 78f.) and 𓂋𓏤𓏴 for /i/ (Edel 1966: 70f.).
- Helck is a prominent modern proponent of a clearly syllabic nature of group writing, which is furthermore essentially free of polyphony. As this approach leads to frequent contradictions between the vocalic values presupposed by his system and those found in extra-Egyptian sources, he assumes that only the stressed vowel was

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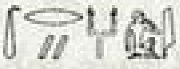
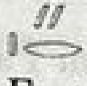
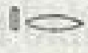
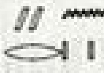
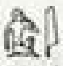
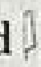
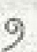
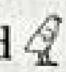
distinguished while all unstressed vowels could be rendered with groups he identifies as *a*-indicators (Helck 1989: 129). The position of the stressed vowel is, however, usually not independently known. His account involves further complications such as vowel assimilations and vowel metatheses (Helck 1989: 132f.). For example, the name of the town Ugarit, cuneiform *u-ga-ri-ID*, is consistently written  in Egyptian group writing, which Helck transcribes as *ʾá-kú-ri-tá* (Helck 1989: 133).

- Schneider (1992) examines transcriptions of Semitic proper names in Egyptian sources of the New Kingdom and discusses the presumable Semitic vowels that were intended to be transcribed. While in principle he adheres to the idea of a syllabic orthography, the picture he presents is that of an essentially polyphonic writing system with a statistic rather than a deterministic way of representing vowels.
- Schenkel (1994c: 294f.) in principle supports the vocalic interpretation of syllabic orthography and explains its mechanism by the "Devanagari-principle": While all consonants may include a following /a/ without further qualification, following /i/ and /u/ need additional means of notation.
- The first scholar to have discarded the syllabic approach was Bondi (1886). He was followed by others such as Sethe (1899-1902, I: § 66 and § 76), Edgerton (1940), and Gardiner (1957, § 60; already in the 1st edition of 1927) who coined the term "group writing" which I prefer to "syllabic orthography" as being more neutral.
- One of the most delicate questions in interpreting group writing is the uncertainty about the vowels to be assumed for the source language. This problem can best be overcome if the examination is restricted to words which are both attested in Late Egyptian group writing and have survived in Coptic. However this drastically reduces the data base since most foreign words were of an ephemeral nature, and transcriptions of place and proper names fall out of consideration completely. Furthermore, only the development of the stressed syllable can be traced since unstressed syllables have largely lost vocalic distinctions in Coptic.

This method was recently applied by Zeidler (1992/93) and by Ward (1996: 41-47). The latter also examines the comprehensive collections of Egyptian transcriptions of Semitic words in Schneider (1992) and Hoch (1994). Zeidler (1992/93: 588f.) comes to the conclusion that only a few groups are unambiguous vowel indicators, especially:

 ~ : /ra/  *et var.*: /la/ : /ʾa/

Furthermore, ‹j› and ‹w› are used as *matres lectionis*, but with double function:
‹j› (and ) indicates /a/ or /i/, ‹w› ( and ) indicates /a/ or /u/.

Zeidler does not explain how consonants in the syllable coda were rendered in group writing.

Ward, although avoiding a definite conclusion, doubts that group writing gives any vowel indication at all.

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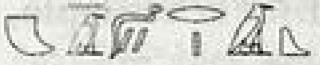
5.4.2.4 *Transliterating group writing*

Scholars who assume that vowel indication existed naturally indicate these vowels in their transcriptions. For example, Hoch (1994: 304) transcribes the group writing  for "axe" as *qa-ra-ḏi-na*.

Other scholars have the choice of transcribing the word by the same conventions as they transcribe the traditional orthography (which would lead to *qꜣrꜣḏynꜣ* in the given example), or of transliterating only the consonants that are meant to be expressed synchronically (*qrḏn*). A rather complex system of the first type which aims at being a largely unambiguous transliteration system of group writing is proposed by Schneider (1992: 9-13). The Egyptian dictionaries prefer the second option. The same is true for Junge (1996: 43) who, in addition, signals group writing by inserting dashes in his transcription: *q-r-ḏ-n*.

Many Demotists employ a specific symbol ‹ṯ› for transcribing a Demotic phonogram which developed from the Late Egyptian group writing grapheme ‹t(i)›. This is a familiar rendering of /t(ʰ)/ in Demotic whereas the Demotic successor of Egyptian ‹t› (𓏏) no longer has a definite sound value in most words. Quack (1994: 4) extends the use of ‹ṯ› to Late Egyptian group writing.

5.5 The development of stressed vowels from Late Egyptian to Coptic

5.5.1 Overview

As was shown in § 4.1, Coptic morphophonological alternations permit a synchronically based internal reconstruction of the vowel system in stressed syllables. The vowel system which results from these considerations is repeated here (the vowels are meant to be those of Sahidic-Bohairic):

	high	low	Paleo-Coptic vowel quality
back	ω	ο	*a*
front (1)	ι	ⲁ	*i*
front (2)	ⲏ	ⲉ (?)	*u*

It was said above that the occurrence of high vs. low vowels is predictable from Paleo-Coptic syllable structure patterns, therefore we do not need to assume a phonemic high-low opposition for the Paleo-Coptic stage. So we are left with three classes of vowel quality which from Coptic evidence alone would have to be described as back, front(1) and front(2). In the cuneiform documents of the 2nd millenium BC, these quality-based classes are usually represented as *a*, *i*, and *u* respectively. The high-low opposition is not clearly visible in the cuneiform transcriptions but must have already been formed by then since the reconstructed syllable structure patterns were no longer preserved at that time.

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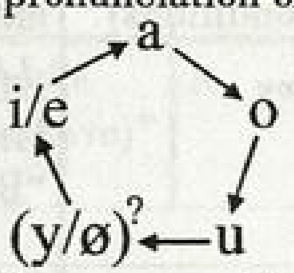
I will call these 6 vowels a_{high}, a_{low}, i_{high}, i_{low}, u_{high}, and u_{low} in the following sections. The reconstruction of 6 vowels for Pre-Coptic Egyptian is accepted by most scholars (e.g. Loprieno 1995: 35; Osing 1980b: 947; Schenkel 1990: 63; Vergote 1973/83: Ib, § 31; Vycichl 1990: 72). However, an opposition long vs. short is traditionally assumed instead of the opposition high vs. low which I favor.

Vowel quality was subject to major restructuring during the time we can observe. Vowel shifts were most pronounced in the two best known Coptic dialects (Sahidic, Bohairic), while the other varieties of Coptic (Akhmimic, Lycopolitan, Fayyumic) are somewhat more archaic in this respect. Greek and Cuneiform evidence seems to indicate that such dialectal differences already existed in the mid 1st millennium BC.

The vowel shifts did not lead to large scale neutralizations of phonological oppositions. Instead they progressed in a circular direction ("chain-shift") so that the pronunciation of most vowels changed but the oppositions remained largely intact.

Between New Kingdom Egyptian and (especially Sahidic-Bohairic) Coptic, most vowels proceeded one or two steps along the following circle:



Similar chain-shifts are known to have taken place in other languages of the area roughly at the same time, such as in the Semitic languages (especially Phoenician where *a* > *o*, *o* > *u* and *u* > *y* are attested) and Greek (ου /oː/ > /uː/, υ /u/ > /y/ > /i/). It is possible that language contact was at work here (on this topic see Fox 1996 and Kammerzell (1998b: 151-169).

The most important sound developments of the Egyptian vowels are as follows:

reconstruction for the Paleo-Coptic stage	i_{high} (normal)	i_{high} (special conditions)	i_{low}	u_{high}	a_{high} (normal)	a_{high} (special conditions)	a_{low} (normal)	a_{low} (special conditions)
cuneiform documents of the late 2nd millennium BC	*i*	*e*	*i/e*[250]	*u*	*a*	*a*	*a*	*a*
mid 1st millennium BC until latest written documents: conservative dialects (Akhmimic etc.)	*i* (Ⲓ)	*e* (Ⲏ)	*ε* (Ⲉ)	*e* (Ⲏ)	*o* (ⲱ)	*u* (ⲞⲨ)	*a* (ⲁ)	*a* (ⲁ)
mid 1st millennium BC until latest written documents: progressive dialects (Sahidic, Bohairic)	*i* (Ⲓ)	*e* (Ⲏ)	*a* (ⲁ)	*e* (Ⲏ)	*o* (ⲱ)	*u* (ⲞⲨ)	ɔ (Ⲟ)	*a* (ⲁ)
Late Coptic (liturgical pronunciation, borrowings into Arabic)	*i*	*a* ~ *i*	*a*	*a* ~ *i*	*u*	*u*	*u*	*a*

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[250] While most scholars agree that i_{low} was still preserved as *i/e* in the New Kingdom, Vergote (1973/83: Ib, § 56 and p. 93) assumes that the dialectal shift to *a* known from later periods had sporadically taken place already by that time.

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5.5.2 Evidence from cuneiform transcriptions

The following lexical items may serve to illustrate these sound developments:[251]

	Egyptian word	Cuneiform transcription 2nd millenium	Cuneiform transcription 1st millenium	Coptic word (Sahidic)	vowel in Sahidic
i_{high} (normal)	*psḏ* "nine"	*pi-ši-ID*[252]	–	ⲯⲓⲥ ~ ⲯⲓⲧ "nine"	ⲓ
	rn-f "his name"	–	*(bu-kur)-ni-ni-ip*[253]	ⲣⲓⲛϥ "his name"	
i_{high} (special conditions)	*mḥy.t* "northern wind"	*(ni-im)-ma-ḫe-e*[254]	–	ˡⲱϩⲏ "breath"	ⲏ
i_{low}	*sbꜣ* "door"	*(pu-u)s-bi-(ú)*[255]	–	ⲥⲃⲉ[256] "door"	ⲁ
	bꜣst.t "Bastet"[257]	–	*(pu-ṭu)-beš-ti*[258] ~ *(pa-AD-ú)-ba-si-ti*[259]	ⲟⲩⲃⲁⲥⲧⲉ "Bastet"	
u_{high}	*ḥꜣ.t* "front"	*(pa-re-a-ma)-ḫu-ú*[260]	*(ma-an-ti-me-AN*[sic]*)-ḫe-e*[261]	ϩⲏ "front"	ⲏ

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[251] More examples can be found e.g. in FECHT (1952), OSING (1976: 11-17), SCHENKEL (1990: 87-90), VERGOTE (1973/83: Ib, §§ 49-57), VYCICHL (1990: 76-106).

[252] EDEL (1975: 11).

[253] BORGER (1996: 21); this is the Egyptian proper name *bꜣk-n-rn-f*, rendered as Βοχορινις in Greek. According to VERGOTE (1973/83: Ib, 85), *bukurninip* is an incorrect rendering of **bukunrinip*. It is also possible that *-rin-* was pronounced with a nasalized ĩ which the Assyrians chose to render by the cuneiform sign *ni* (which can also be read ì).

[254] EDEL (1954: 32).

[255] EDEL (1975: 15). *-ú* is probably to be regarded as the nominative case suffix of Akkadian.

[256] ⲉ for ⲁ in word-final position, ☞ § 5.6.1.

[257] It is possible that the stressed vowel in this word was u_{low} rather than i_{low}.

[258] BORGER (1996: 21) (Assurbanipal prism A I 96). The syllabogram *beš* can equally be read *biš*.

[259] Neo-Babylonian, from ZADOK (1983: 73). For further early attestations of i_{low} as *a* see OSING (1976a: note 55 on p. 376).

[260] EDEL (1980: 20).

[261] BORGER (1996: 21). I cannot explain *-AN-*, a cuneiform sign which can also be used as a determinative before divine names. This writing is attested in no less than three different text copies: K 15110+ (= BM 91026), K 1678+ (= BM 91086), and K 1697+.

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u_{low}	*mꜣꜥ.t* "truth"	*(wa-aš)-mu-a-(re-a)*[262]	–	ⲙⲉ "truth"	ⲉ
	ẖr "Syrian"	*(pa)-ḫu-ra*[263]	*(pi)-ḫi-ri*[264]	ϩⲁⲗ "servant"	ⲁ
	kꜣ (part of the human personality)	*ku-i-I(Ḫ-ku)*[265]	–	ⲕⲟⲓ(ⲁϩⲕ) (a month name)	ⲟ
a_{high} (normal)	*ḥrw* "Horus"	*ḫa-a-ra-(ma-aš-ši)*[266]	*ḫu-ú-ru*[267]	ϩⲱⲣ "Horus"	ⲱ
a_{high} (special conditions)	*nfr* "good"	*(zi)-na-a-pa*[268]	*(ḫar)-nu-pi-iʾ*[269]	ⲛⲟⲩϥⲉ "good"	ⲟⲩ
a_{low} (normal)	*nꜣ msḥ.w* "the crocodiles"	*nim-ša-ḫu*[270]	*nam-su-ḫa*[271]	ⲛⲉ-ⲙⲥⲟⲟϩ "the crocodiles"	ⲟ
a_{low} (special conditions)	*nḫt.w* "to be strong (stative)"	*(w[a-aš-mu-a]-re-a)-na-aḫ-ta*[272]	*(ḫu-UD)-na-aḫ-te*[273]	ⲛⲁϣⲧ "to be strong (stative)"	ⲁ

5.5.3 Evidence from Semitic loan words

These developments are basically confirmed by words which were borrowed from Semitic during the New Kingdom and are still preserved in Coptic. It can easily be seen by the examples collected in appendix 5 that several of these words participated in the vowel shift *a* > ⲟ/ⲱ. This evidence is crucial: If we had nothing but the cuneiform transcriptions, it would be possible to assume that there was never a shift *a* > *o* and cuneiform *a* was merely an imperfect rendering of Egyptian *o*, a sound which cannot be clearly expressed in the cuneiform syllabary.

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262 Albright (1946a: 23).
263 Albright (1946a: 18).
264 Bongenaar & Haring (1994: 69).
265 Lambdin (1953b: 366). The sign IḪ is indetermined as to the vowel and can be read *aḫ*, *eḫ*, *iḫ*, or *uḫ*. The same Egyptian word *kꜣ* is attested in two more cuneiform transcriptions of the 2nd millennium: *za-ab-na-ku-u* for *ṯꜣb-n-kꜣ* (Lambdin 1953b: 369) and *ḫi-ku-up-ta-aḫ* for *ḥw.t-kꜣ-ptḥ* (Ranke 1910: 10).
266 Albright (1946a: 12). *ḫa-a-ra* bears full stress as is evidenced by the preservation of word-final *-a* (Zeidler 1995: 215).
267 Bongenaar & Haring (1994: 68).
268 Edel (1948: 21).
269 Bongenaar & Haring (1994: 67).
270 Lambdin (1953c).
271 Lambdin (1953c).
272 Albright (1946a: 23); probably the same individual is attested as *wa-aš-mu-a-re-a-na-[aḫ-ta]* (Edel 1948: 21).
273 Zeidler (1994: 48f.).

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5.5.4 Evidence from Meroïtic and Nubian

Certain Egyptian borrowings into Meroïtic and Nubian still show vowels as we reconstruct them for Paleo-Coptic, although Meroïtic is attested only from the 2nd century BC and Nubian much later. We have to conclude that these Egyptian words passed into a predecessor language of Meroïtic around the time of the New Kingdom at the latest, and did not take part in the sound changes which Egyptian experienced afterwards. Meroïtic therefore confirms the sound shifts a_{high} > ⲱ as well as u_{high} > ⲏ as the following examples illustrate (from Hintze 1973b: 332):

- *ḥr* "Horus (divine name)" > Meroïtic *ara*; but Coptic ϩⲱⲣ
- *ꜣs.t* Isis (divine name) > Meroïtic *wusa*, but Coptic ⲏⲥⲉ.

The divine name *imn* "Amun" is one of the testimonies of the shift a_{high} > ⲱ. This name is attested in New Kingdom cuneiform transcriptions as *a-ma-na*, *a-ma-a-nu et var.*, and appears with *-o-* or *-u-* from the 1st millennium BC on: cuneiform *a-mu-nu*, Hebrew אָמוֹן, Greek αμμων~αμουν, Coptic ⲁⲙⲟⲩⲛ.[274] However the same god is known as *amaṉi* from Meroïtic.[275] The name of the last king of the Egyptian Dynasty 25 which was of Nubian origin, *tnwt-imn*, is transcribed in Neo-Assyrian cuneiform as *taš-da-ma̱-né-e*, *taš-da-am-ma̱-né-e*, *taš-da-am-ma̱-né-eʾ* (Borger 1996: 24f.). The Meroïtic royal name *irq-imn(-k)*, in which the element *imn* refers to the same god, is transcribed in Greek as εργαμε̱νης.[276]

All this indicates that original a_{high} was preserved as such (or even developed into *e* as evidenced by εργαμενης) in the ancient language(s) to the South of Egypt, whereas it shifted to *u* in Egypt itself.

Similar archaisms can still be found in modern Nubian. For example, the noun *nbw* ('nabwV) "gold" is preserved as ⳡⲁⲡ *ŋap* in Old Nubian (Browne 1996: 197) and as *náb* in modern Nobiin (Werner 1987: 369) whereas Coptic has ^{s,b}ⲛⲟⲩⲃ. The noun *irp* ('jurpV) "wine" is preserved as ⲟⲣⲡ(ⲁ) *orp*(*a*) in Old Nubian (Browne 1996: 128; not attested in modern Nubian) whereas Coptic has ^{s,b}ⲏⲣⲡ. (For additional examples see Vycichl 1993: 335f.). It appears that these words were borrowed into a forerunner of Nubian no later than the 2nd millennium BC.

5.5.5 The case of u_{low}

The low vowel of the *u*-class poses a problem. There are three different assumptions about its basic development since evidence is contradictory. The strongest piece of evidence for each is given in the list in § 5.5.2.

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[274] Cf. Vycichl (1983: 10f.). The second *a* is important here since the first *a* is pretonic and cannot therefore be subject to this sound shift.

[275] Hintze (1973b: 332).

[276] Diodorus Siculus, Βιβλιοθήκη 3.6.3, see Eide *et al.* (1996: 643). On the identification see Priese (1968: 186).

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- The traditional view holds that u_{low} develops into ^{s}ⲉ (Albright 1923: 68; Calice 1928; Lambdin 1958: 187; Vergote 1973: Ib, 45f. who also assumes a development u_{low} > ⲏ).
- Fecht (1952: 56-65) is the first scholar to have argued that the regular development is u_{low} > ^{s}ⲁ which is to say that u_{low} merged with i_{low}. Fecht assumes that the development u_{low} > ^{s}ⲉ, attested mainly by the noun *mꜣꜥ.t* (☞ § 5.5.2), is due to specific phonetic conditions and therefore irregular. His view is adopted by most subsequent scholars such as Osing (1976a: 11-17), Schenkel (1990: 87f.), Loprieno (1995: 46), and Kammerzell (1998b: 156).

  In the case of a graphic double vowel, which I interpret as a long vowel, Osing (1976a: 16f.) derives ^{s}ⲁⲁ from i_{low} but ^{s}ⲉⲉ from u_{low}.
- The example *kꜣ* (☞ § 5.5.2) suggest that u_{low} could also develop into ^{s}ⲟ, i.e. merge with a_{low}. Sethe (1923: 174) and Zunke (1997 [1923]: 44, 47f.) therefore accept that, besides u_{low} > ⲉ, a development u_{low} > ⲟ is also possible. Vycichl (1990: 75f., 98-106) goes further and considers u_{low} > ⲟ the regular development. Other scholars (e.g. Fecht 1952: 8f., Edel 1954: 35) reconstruct the noun *kꜣ* with a_{low} rather than u_{low} at the Paleo-Coptic stage and assume that the New Kingdom cuneiform transcriptions, which consistently have *u* in this word, already reflect the sound change by which a_{low} developed into ^{s}ⲟ, arguing that the following ‹ꜣ› may have accelerated this sound shift. However, as Vergote (1973/83: Ib, § 55) and Satzinger (1989: 158) remark, this seems to be contradicted by the word *tꜣ* > ⲧⲟ "land", which is structurally similar to *kꜣ* and is preserved as *(ni-ib)-ta-a-(wa)* with unchanged *a* in New Kingdom cuneiform transcriptions. Furthermore, the lack of palatalization of *k* in Coptic seems to support a reconstruction with *u*-vowel (☞ § 3.9.4.3).
- In order to explain the various Coptic reflexes of u_{low} in the cuneiform transcriptions, Sturm (1933) assumes that there were back vowels of two distinct qualities in Egyptian: 1) *o* which yields the correspondence cuneiform *u* – Sahidic ⲟ, and 2) *u* which yields the correspondence cuneiform *u* – Sahidic ⲉ. This solution is possible, but one may hesitate to stipulate an additional phoneme on the basis of the development of a single word. An additional problem which would arise is that no similar distinction between *o* and *u* is known from the high vowels.

  Vycichl (1953b: 377; 1957a: 218; 1958: 404; 1990: 126; somewhat differently Vycichl 1959b: 29) also considers the possibility that the correspondence cuneiform *u* – Sahidic ⲟ points to an original *u* and the correspondence cuneiform *u* – Sahidic ⲉ to an original rounded front vowel: "Das ägyptische *u* hatte in vielen Fällen wohl eine besondere Färbung (etwa nach *ö* hin)" (Vycichl 1958: 404). He further adduces the assumption that Proto-Afroasiatic *u* sometimes seems to have had a palatalizing effect on preceding velars in Egyptian (☞ § 3.9.1), which may also favor an interpretation as a front vowel. However, Vycichl does not seem to have drawn a definite conclusion about whether Egyptian had two distinct low rounded vowels or not.

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I conclude that the evidence currently available is not sufficient to make a clear decision on the issue.

While all scholars accept that ^{s}ⲉ arose from u_{low} at least under certain conditions, it seems that i_{low} could likewise develop into ^{s}ⲉ (besides regular ^{s}ⲁ), especially in word-final position (☞ § 5.6.1). I will not discuss this further here.

5.5.6 A special problem: ⲏ in Late Coptic

5.5.6.1 *Previous treatments of the issue*

In the liturgical recitation of Coptic according to the modern "reformed pronunciation", ⲏ is always pronounced [i(:)] which is identical to the value of η in Modern Greek. This pronunciation is doubtless secondary and is a mere simplification of a more ancient practice in which two pronunciations [a(:)] and [i(:)] coexisted.[277]

Older sources about Late Coptic show that [a] and [i] as realizations of ⲏ did not occur in free variation, but the pronunciation was more or less consistent in each word. There have been different attempts to give rules for this. Rochemonteix (1892: 120f.) states that [a] was primarily used in closed syllables and [i] in open syllables. According to Prince (1902: 297), [a] was used in native words and [i] in borrowings from Greek. As can easily be checked by the data assembled in appendix 7, both explanations leave many exceptions.

Vycichl and Worrell[278] propose an interesting alternative theory according to which Coptic ⲏ has always been polyphonous and the pronunciation of Late Coptic still reflected its double etymology. According to this theory, ⲏ $< i_{\text{high}}$ was spoken /e:/ in Coptic which became /i:/ in Late Coptic, and ⲏ $< u_{\text{high}}$ developed into a rounded front vowel /ø:/ which resulted in Late Coptic /a:/. If this were true, the Late Coptic pronunciation would continue a very ancient phonological distinction which was never expressed in Coptic writing and was commonly believed to have long disappeared. In their publications about the traditional pronunciation of Coptic in the village iz-Zēnīya (on this ☞ § 2.2.1), Vycichl and Worrell not only present several texts with transcription, but in addition they record the pronunciation of a number of isolated words that contain ⲏ (Vycichl 1936: 171f., Worrell 1937: 5-7, Worrell & Vycichl 1942: 315-318). It remains unclear how these words were elicited.

The suggestion that Late Coptic preserved an ancient phonological distinction covered by a single Coptic letter ⲏ was subsequently accepted by several scholars such as Fecht (1952: 69f.), Lambdin (1958: 179), Knudsen (1962: 29f. and 36), and by myself (Peust 1992: 118). However several reservations have to be made:

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[277] Another pronunciation tradition is reported by Worrell (1937: 5) who states that ⲏ could be uniformly pronounced [a(:)], but no further details are known about this.

[278] See Vycichl (1936: 171f. and 1959a: 54), Worrell (1937: 5-7), Worrell & Vycichl (1942: 314-318).

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- Vycichl's and Worrell's informants sometimes produced contradictory pronunciations (cf. Worrell 1937: 7).
- As was already remarked by Lambdin (1958: 180), the recordings in the lists sometimes contradict what is found in the transcribed texts.
- The authors admit that not all data from their lists fit their own explanation (Worrell & Vycichl 1942: 315-317).
- In addition to these cases admitted by the authors, there are further cases in which the recorded pronunciation does not fit what we know about the etymology of ⲏ.[279]
- Probably the strongest argument is that both pronunciations of ⲏ are well attested also in Greek loan words, which does not agree with the etymological explanation.

5.5.6.2 A reexamination

I am now of the opinion that Worrell's and Vycichl's theory is unconvincing. Appendix 7 presents evidence on the Late Coptic pronunciation of a little less than 200 words containing ⲏ. There are several sources which show a certain variability, nevertheless it is clear that the pronunciation of ⲏ was not arbitrary. Based on these data, which include sources much older than the recordings by Vycichl and Worrell, I suggest that the different pronunciations of ⲏ are phonetically conditioned and do not reflect an ancient phonological opposition. If Late Coptic evidence is contradictory, I have preferred the vocalization of the earlier sources (Farag 1976, Cramer 1961, Sobhy 1940, Strelcyn 1957, Galtier 1906) to that of the later sources. It should be emphasized that the following conclusions are based on very imprecise and sometimes doubtful data and are far from being definitive.

- ⲏ is consistently pronounced [a] in monosyllabic words, e.g.: ⲙⲏⲓ [maj], ⲛⲏⲃ [nab], ⲧⲏⲣϥ [darf], ϩⲏⲡ [hab], ϭⲗⲏ [ʃla]. It should be noted that all of these are native Coptic words and ⲏ is stressed throughout. However the demonstrative pronouns ⲫⲏ, ⲑⲏ, ⲛⲏ consistently appear with [i], perhaps because they are considered as proclitic.
- In polysyllabic words, both [a] and [i] are frequent. It is possible that [a] was originally the pronunciation of stressed ⲏ and [i] of unstressed ⲏ. This is suggested for instance by the Ethiopian transcriptions of ⲡⲣⲟⲫⲏⲧⲏⲥ and ⲙⲁⲑⲏⲧⲏⲥ which indicate a pronunciation [-adis] for the first word (< προφήτης) but [-idas] for the second (< μαθητής). However most sources give [-idas] for both words, which may be the result of analogical levelling. Altogether, the stress hypothesis is not a good explanation for many of the data.
- As far as the pronunciation of ⲏ in final syllables of polysyllabic words is concerned, native Coptic words usually have [a], e.g. ⲉⲥⲏⲧ, ⲑⲉⲗⲏⲗ, ⲛⲁⲏⲧ, ϣⲟⲩⲣⲏ.

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[279] ⲣⲏ "sun", recorded with [aː] (Worrell & Vycichl 1942: 315), is attested in New Kingdom cuneiform texts with ‹i›/‹e› rather than with ‹u›. ⲛⲏⲃⲓ "to swim", recorded as [naːwi] (Worrell & Vycichl 1942: 316), is a verb of the 'CiCtV-class.

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In Greek words, both [a] and [i] occur without apparent rule, cf. ⲁⲙⲏⲛ, ⲁⲣⲭⲏ, ⲙⲟⲛⲟⲅⲉⲛⲏⲥ with [i]; ⲉⲩⲭⲏ, ⲓⲱⲥⲏⲫ, ⲯⲩⲭⲏ with [a]. The native Coptic month name ⲉⲡⲏⲡ is unexpectedly spoken with [i]. Perhaps it was considered a Greek word since it was also used in Greek documents written in Egypt.

- There seem to exist two principles determining the pronunciation of ⲏ in non-final syllables. On the one hand, [a] is most common in native words and [i] in words of Greek origin, cf. e.g. ⲣⲏϯ, ⲧⲏⲣⲟⲩ, ⲫⲏⲟⲩⲓ with [a]; ⲓⲏⲥⲟⲩⲥ, ⲭⲏⲣⲁ, ϩⲓⲣⲏⲛⲏ with [i]. But there is also evidence for a vowel dissimilation rule according to which ⲏ is pronounced [a] if there is a spoken [i] in the following syllable, and [i] if there is none. This seems to be the easiest explanation for the following morphophonological alternations:

  ⲃⲟⲏⲑⲟⲥ with [i] — ⲃⲟⲏⲑⲓⲛ with [a]
  ⲥⲱⲧⲏⲣ with [i] — ⲥⲱⲧⲏⲣⲓⲁ with [a]
  ⲛϧⲏⲧⲟⲩ with [i] — ⲛϧⲏϯ with [a]

  Where both principles conflict, the pronunciation can vary. For example, ⲉⲕⲕⲗⲏⲥⲓⲁ is attested both with [a] (because of *i* in the following syllable) and with [i] (because of its Greek origin) at least twice each.

  The native word ϣⲏⲣⲓ "son" has unexpected [i], perhaps to avoid homophony with ^{b}ϣⲉⲣⲓ "daughter" where ⲉ is pronounced [a] in Late Coptic.

The development of ⲏ in loans and place names in modern Arabic more or less agrees with these rules, although a closer examination would be desirable. Cf. the following examples:

- ⲁⲡⲟⲑⲏⲕⲏ, name of a town in Middle Egypt, a loan from Greek > /ʔabu-'ti:ǧ/ (☞ appendix 9)
- ^{s,b}ⲉⲡⲏⲡ (11th month of the Coptic year) > /ʔa'bi:b/ (☞ appendix 6)
- ^{s,b}ⲙⲉⲥⲟⲣⲏ (12th month of the Coptic year) > /'misra/ (☞ appendix 6)
- ^{s,b}ⲣⲏⲓ "alestes dentex (a fish)" > /'ṛa:j/ (idem) (Hinds & Badawi 1986: 319, Vittmann 1991: 212)
- ^{s}ⲥⲏⲃⲉ, ^{b}ⲥⲏⲃⲓ "reed" > /'si:ba/ "dreifüßiges Gestell" (Behnstedt 1981: 91, northern and middle Egypt)
- ^{s}ⲥⲏⲃⲉ, ^{b}ⲥⲏⲃⲓ "reed" > /sab'ju:na/ "Grindel" (Behnstedt 1981: 91, northern and middle Egypt; the suffix *-u:na* is of unclear origin)
- ⲥⲛⲏ, name of a town in Upper Egypt > /'ʔisna/ (☞ appendix 9)
- ^{s}ⲧ-ⲉⲙⲏⲣⲉ, ^{b}ϯ-ⲁⲙⲏⲓⲣⲓ "inundation" > /di'mi:ra/ ~ /di'me:ra/ "time of flood" (Hinds & Badawi 1986: 304, Vittmann 1991: 209)
- ⲧ-ⲙⲱⲛⲏ, name of a town in Middle Egypt, a loan from Greek > /ʔil-'minja/ (☞ appendix 9)
- ^{s}ⲧ-ϣⲏⲧⲉ "palm fibre, belt, collar" > /di'ʃi:da/ "Nackenschlinge am Jochbaum, häufig aus Palmfasern" (Behnstedt 1981: 85, Delta)
- ^{s,b}ϣⲟⲩⲣⲏ "censer, thurible" > /'ʃurja/ (Hinds & Badawi 1986: 463, Vittmann 1991: 215)

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5.5.7 On the development of the high vowels

The normal developments of a_{high}, i_{high}, and u_{high}, which were exemplified in §§ 5.5.2-5.5.4, are ⲱ, ⲓ, and ⲏ respectively. However there is also evidence for deviant developments a_{high} > ⲟⲩ, i_{high} > ⲏ, and u_{high} > ⲓ. These deviant developments can in part, but not completely, be assigned to specific phonetic environments. This can be summarized as follows:

	a_{high}	i_{high}	u_{high}
normal development	ⲱ (~ ⲟⲩ)	ⲓ (~ ⲏ)	ⲏ
after ⲛ, ⲙ	ⲟⲩ	ⲏ	ⲏ
before ⲓ /j/	ⲟⲩ	ⲏ ?	ⲏ ?
before ⲣ, ⲗ	ⲱ ~ ⲟⲩ	ⲓ	ⲏ ~ ⲓ

Among these, only the development i_{high} > ⲏ is already evident in cuneiform transcriptions of the New Kingdom.[280]

a_{high} regularly developed into ⲟⲩ after nasals (☞ § 5.6.3.1) and before /j/ (☞ § 5.6.6.1). The development is inconsistent before liquids (☞ § 5.6.4.1). Aside from these special environments, only a few Coptic words remain which have ⲟⲩ /'u/, e.g.:[281]

- *ẖnw* "inside" (since OK) > ^{s}ϩⲟⲩⲛ /'hun/, ^{b}ϧⲟⲩⲛ
- *šsd* "window" (since NK) > ^{s,b}ϣⲟⲩϣⲧ /'ʃuʃt/
- *rh* (or to be read *rwhꜣ* ?) "evening" (since NK) > ^{s}ⲣⲟⲩϩⲉ /'ruhə/, ^{b}ⲣⲟⲩϩⲓ

Although difficulties remain, ⲟⲩ more probably derives from a_{high} here rather than from i_{high} or u_{high}. However Vergote (1973/83: Ib, § 39) proposes that ⲟⲩ in these words is based on a contraction of u_{low} + *w*. But the presence of this presumed *w* is not easy to reconcile with the actual Egyptian writings of most of these words.

Of course, Coptic ⲟⲩ /'u/ can also occur in late loans to render *u* of the source language:

- Demotic *pꜣ-ỉšr* (proper name, lit. "the Assyrian") > ⲡⲉϣⲟⲩⲣ, transcribed in Greek as πεσυρις, cf. Akkadian *aššurû* "Assyrian" (Vycichl 1983: 167)
- Demotic *qpr* > ^{s}ⲕⲟⲩⲡⲣ, ^{b}ⲭⲟⲩⲡⲉⲣ "henna", cf. Hebrew כֹּפֶר, Greek κύπρος ~ κύπρις (Vycichl 1983: 84f.)
- Demotic *gbyr* "left" > ^{s}ϩⲃⲟⲩⲣ, ^{l}ϭⲃⲟⲩⲣ, ^{a}ϭⲃⲓⲣ (on the Akhmimic form ☞ § 5.6.4.2)

The regular outcome of i_{high} is (ⲉ)ⲓ, this is also found before liquids.[282] However i_{high} appears to develop into ⲏ after nasals and before /j/(☞ §§ 5.6.3.1 and 5.6.6.1), obviously

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[280] Cf. the example *mḥy.t* in § 5.5.2 and the New Kingdom transcriptions *re/i-ja* ~ *re/i-a* ~ *re-e* et var. of *rʿ* "sun" > ^{s,b}ⲣⲏ (Albright 1946a: 14-23).

[281] For further examples see Osing (1976a: note 46 on p. 365-367), Ernštedt (1986: 113f.), Vycichl (1990: 242-244).

[282] Cf. infinitives such as *ir.t* "to do" > ^{s}ⲉⲓⲣⲉ, ^{b}ⲓⲣⲓ and *pr.t* "to come forth" > ^{s}ⲡⲉⲓⲣⲉ, ^{b}ⲫⲓⲣⲓ. They belong to the familiar class of infinitives of the type ('CiCCV). It is generally supposed that there was no infinitive class ('CuCCV).

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under the same conditions under which a_{high} develops into ⲟⲩ. But it seems that examples of the development $i_{\text{high}} >$ ⲏ are also found in other environments, cf. Osing (1976a: 19-26).

The regular outcome of u_{high} is ⲏ which is also found after nasals.[283] It seems that u_{high} could develop into either ⲏ or (ⲉ)ⲓ when preceding ⲣ, ☞ § 5.6.4.2.

Since the development of high vowels by the Coptic period is not completely predictable, a few scholars have suggested that there were more than three high vowels in Paleo-Coptic. As is explained in § 6.1.7, some scholars assume that Egyptian possessed a distinctive vowel quantity opposition at a Pre-Paleo-Coptic stage. Contrary to the general belief, Vycichl (1957a: 216-218 and 1959a: 51-54) suggests that this Pre-Paleo-Coptic quantity opposition was not completely neutralized by Paleo-Coptic. His theory is expressed within the framework of the traditional interpretation of the Coptic vowel system and the syllable structure rules. He assumes that the distinction between Pre-Paleo-Coptic short and long vowels was preserved in open stressed syllables (which in my view would be closed stressed syllables) because when short vowels were lengthened (in my view: became high) they became distinct in quality from the original long vowels. In principle it is possible to adapt Vycichl's scenario to the revised model proposed in this book. The correspondences assumed by Vycichl are the following:

Pre-Paleo-Coptic vowel quantity	Paleo-Coptic vowel type in the traditional framework	Paleo-Coptic vowel type in the revised framework	*a*-class	*i*-class	*u*-class
short or long	short (or shortened) vowel	low vowel	ⲟ	ⲁ	ⲟ, ⲉ
short	long (i.e.: lengthened) vowel	high vowel	ⲱ	ⲓ /iː/	ⲏ /øː/
long	long (i.e.: originally long) vowel	high vowel	ⲟⲩ	ⲏ /eː/	ⲓ /yː/

It is not quite clear how Vycichl combines this theory with the conditioned sound shifts, the reality of which is undisputed. There is no question that Vycichl accepts for instance the conditioned sound shift $a_{\text{high}} >$ ⲟⲩ after nasals (cf. e.g. Vycichl 1990: 73f., 230-233). Vycichl raises some doubt about his theory in Vycichl (1966: 505). In his later works, his position remains somewhat unclear (cf. Vycichl 1983: x and 1990: 73-75, 91-96, 102-105, 172-174, 242-244). Independently from Vycichl, Lambdin (1958: 191) advances a very similar theory according to which Pre-Paleo-Coptic long *ī* developed into (ⲉ)ⲓ but Pre-Paleo-Coptic short *i* developed into ⲏ when lengthened.

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[283] Cf. the word *nʾ.t* "Thebes", attested as *nu*-[...] in cuneiform transcription of the New Kingdom > Coptic ⲛⲏ (see Edel 1980: 15-20).

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5.5.8 Diphthongization

There are several Coptic words with diphthongs where the semivocalic element seems to be lacking from the Egyptian etymon. Most of these cases concern the diphthong ^{s}ⲟ(ⲉ)ⲓ /ɔj/, ^{b}ⲱⲓ, ^{a,f}ⲁ(ⲉ)ⲓ. Examples:

- *ỉp.t* (a measure) > ^{s}ⲟⲉⲓⲡⲉ /ˈɔjpə/, ^{b}ⲱⲓⲡⲓ
- ^{s}ⲟⲉⲓϣ /ˈɔjʃ/, ^{b}ⲱⲓϣ "cry", a derivation from *ꜥš* > ^{s,b}ⲱϣ "to cry"
- *ꜥqw* "bread" > ^{s}ⲟⲉⲓⲕ /ˈɔjk/, ^{b}ⲱⲓⲕ
- ^{s}ⲟⲩⲟⲉⲓⲛ /ˈwɔjn/, ^{b}ⲟⲩⲱⲓⲛⲓ "light", possibly a derivation from *wn* > ^{s,b}ⲟⲩⲱⲛ "to open" (Vycichl 1983: 231)
- *wḏ* "stela" > ^{s}ⲟⲩⲟⲉⲓⲧ /ˈwɔjt/
- *mṯn* "way" > ^{s}ⲙⲟⲉⲓⲧ /ˈmɔjt/, ^{b}ⲙⲱⲓⲧ
- *nk* "adulterer" > ^{s}ⲛⲟⲉⲓⲕ /ˈnɔjk/, ^{b}ⲛⲱⲓⲕ
- *nḏw* "flour" > ^{s}ⲛⲟⲉⲓⲧ /ˈnɔjt/, ^{b}ⲛⲱⲓⲧ
- *rs* "to awake" > ^{s}ⲣⲟⲉⲓⲥ /ˈrɔjs/, ^{b}ⲣⲱⲓⲥ~ⲣⲱⲥ
- *ḥṯ.t* "hyena" > ^{s}ϩⲟⲉⲓⲧⲉ /ˈhɔjtə/, ^{b}ϩⲱⲓϯ
- *ṯzw* "commander" > ^{s}ϫⲟⲉⲓⲥ /ˈcɔjs/, ^{b}ϭⲱⲓⲥ "lord"

More rarely we find a hard to explain ^{s}ⲁ(ⲉ)ⲓ /aj/ or ^{s}ⲁⲩ /aw/ (for examples cf. Vycichl 1990: 86, 96f., 105, 200-203).

None of these words is attested in an early cuneiform transcription. In principle there are three ways of explaining this phenomenon:

1) Most scholars assume that the glide was already present in the earlier language. They try to find rare recordings of these words with *j* (or *w*) or assume that it was always hidden by defective writing.[284]

Occasionally it is argued that the glide was not actually present in the older language. In this case, the Coptic form is either

2) the result of a secondary diphthongization[285], or else
3) a digraph writing of a single spoken vowel.[286]

The latter solution seems improbable because of the regular patterns of interdialectal vowel correspondence. Only if the Sahidic writing ⲁⲓ is considered in isolation, the idea can come to mind that it renders a single vowel like /ɛ/ as αι does in Hellenistic Greek. But ^{s}ⲁⲓ corresponds to Akhmimic ⲉⲓ according to the common correspondence ^{s}ⲁ – ^{a}ⲉ,

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[284] E.g. Sethe (1899-1901: I, § 95a), Till (1937: 136), Edel (1955/64: § 227), Fecht (1960: § 212), Vergote (1973/83: Ib, § 36 *in fine*), Vycichl (1990: 130).

[285] Probably the assumption of Vycichl (1959a: 53 [ⲁⲓ, ⲁⲩ, and ⲟⲓ] and 1990: 86, 96f., 105, 200-203 [ⲁⲓ and ⲁⲩ, ⲟⲓ no longer considered]).

[286] A few scholars have explained ⲁⲓ as a graphical rendering of an *e*-vowel (Sethe 1899/1902: I, § 39; Lambdin 1958: note 33 on page 184), or ⲁⲩ as a rendering of an *o*-vowel (Sethe 1899/1902: I, § 45) in certain lexical items. Vycichl (1983: 54, 1990: 203) suggests that the once-attested writing ⲟⲓⲣⲡ for usual ⲏⲣⲡ "wine" serves to express an *ö*-sound.

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which proves that ⲁⲓ expresses a sequence of two phonetic segments, namely the vowel ^{s}ⲁ, ^{a}ⲉ and the glide ⲓ. In cases of irregular dialectal correspondences, however, the digraph hypothesis may still be interesting.
I cannot make a decision between solutions 1) and 2).

5.5.9 Monophthongization

It is sometimes assumed that the combination low vowel + glide could be contracted into a high vowel. The following proposals for vowel contractions have been advanced:

- $i_{\text{low}} + j >$ Ⲏ[287]
- $i_{\text{low}} + j >$ (ⲉ)ⲓ /i/[288]
- $u_{\text{low}} + w >$ Ⲏ[289]
- $u_{\text{low}} + w >$ ⲟⲩ[290]

This question is in principle difficult to resolve since the proposed scenario is only applicable under the following conditions:

1) The stressed vowel, as visible in Coptic, is high.
2) The glide has disappeared in Coptic. This implies that the original relative position of the stressed vowel and the glide is not immediately obvious.
3) The stressed vowel is considered irregular with respect to the syllable structure rules: It is assumed to have been in a position which rather should have produced a low vowel, i.e. it is assumed to have been followed by an odd number of consonants. If the vowel agreed to the syllable structure rules, there would be no need to posit a change of the vowel class by contraction.

However assumption 3) can be avoided by positing a different relative order of the glide and the stressed vowel in Paleo-Coptic. This can easily be done since the glide is no longer present in Coptic and can therefore be assumed in either position. An even number of consonants will then follow the stressed vowel in the reconstructed form.

For a case of monophthongization restricted to Akhmimic ☞ § 5.6.3.2.

5.5.10 Vowel quantity from a diachronic perspective

5.5.10.1 Preliminary remarks

Paleo-Coptic, the product of internal reconstruction out of the Coptic dialects, has no distinctive vowel length. It is, of course, possible to assume that distinctive length existed but left no traces in Coptic. This is what some scholars assumed in order to bring

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[287] Vergote (1973/83: Ib, § 30h), Fecht (1960: note 263 on p. 86 and p. 248), Osing (1976a: 26, 388f. and note 132 on p. 468-475).

[288] Sethe (1899-1902: I, § 135), Fecht (1960: note 263 on p. 86 and p. 248), Osing (1976a: 26 and note 132 on p. 468-475).

[289] Vergote (1973/83: Ib, § 30i and § 39), Fecht (1960: 121, 185), Osing (1976a: 19).

[290] Vergote (1973/83: Ib, § 30i and § 39).

Egyptian closer to the Semitic languages (☞ §§ 5.5.7, 6.1.7), but there is no justification for this from the Egyptian data alone.

At a time subsequent to Paleo-Coptic, vowel length arose in connection with consonantal losses (☞ below). Long vowels are visible in most Coptic dialects where they are marked by doubling the vowel letter (☞ § 5.2.3).

Graphical complications can arise from the fact that glides are frequently written by digraphs as ⲉⲓ and ⲟⲩ respectively. For example, the combinations /ɛj/ and /ɔw/ are usually written ⲉⲉⲓ and ⲟⲟⲩ in Sahidic, so there are superficially double vowels which do not indicate vowel length. On the other hand, there are reasons to assume that the sequences /ɛːj/ and /ɔːj/ also occurred in the spoken language, but there was no way of distinguishing them in writing (writings such as *ⲉⲉⲉⲓ and *ⲟⲟⲟⲩ are used virtually never[291]). We can frequently decide this matter by taking forms from other dialects into consideration. To take an example, ^{s}ϩⲟⲟⲩ “bad” must be /'hɔw/ because the Akhmimic form is ϩⲁⲩ, but ^{s}ϩⲟⲟⲩ “day” must be /'hɔːw/ because the Akhmimic form is ϩⲟⲟⲩⲉ (☞ §§ 5.3.1, 5.3.3, 5.8.2).

We have no attestations of a vowel quantity opposition from Pre-Coptic times. Since long vowels were created by consonantal losses which occurred no later than the New Kingdom, a quantity opposition must have nevertheless existed already at that time.

5.5.10.2 Details

The loss of a consonant can lead to the compensatory lenghthening of a preceding vowel.[292] This result can only be observed in Coptic. The conditions are as follows:

If a consonant is lost in the sequence 'VCV, the stressed vowel is lengthened:

- *ỉ3rr.t* (jV'ꜣarVrtV) “grape” (> jV'raꜣVrtV by metathesis?) > ^{s}ⲉⲗⲟⲟⲗⲉ /ə'lɔːlə/
- *ỉtrw* ('jatVrwV) “river” > ^{s}ⲉⲓⲟⲟⲣ /'jɔːr/
- *w3ḏ.t* ('waꜣVd̠tV) “vegetables” > ^{s}ⲟⲩⲟⲟⲧⲉ /'wɔːtə/
- *m3wṯ* ('miꜣVwt̠V) “to think” > ^{s}ⲙⲉⲉⲩⲉ /'mɛːwə/
- *zn.t-f* ('zinVtfV) “to pass him” > ^{s}ⲥⲁⲁⲧϥ /'saːtf/
- *sꜥnḫ* ('saꜥVnḫV) “to nourish” > ^{s}ⲥⲁⲁⲛϣ /'saːnʃ/
- *ṯbw.t* ('t̠abVwtV) “sandal” > ^{s,a}ⲧⲟⲟⲩⲉ /'tɔːwə/
- *ḏr.t-f* ('d̠arVtfV) “his hand” > ^{s}ⲧⲟⲟⲧϥ /'tɔːtf/

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291 ⲟⲟⲟⲩ is attested once in ⲙⲡⲟⲟⲟⲩ “today” in Papyrus Bodmer VI (Kasser 1985: 91).

292 In the traditional view which interprets Coptic double vowels as indicators of a glottalic consonant rather than of vowel length, these cases are interpreted quite differently (cf. § 5.2.3.1).
Vycichl (1951: 73, 1957a: 221 and 1990: 197f.) suggests that Coptic vowel doubling was not necessarily caused directly by the loss of a consonant, but rather that the consonant could have first been assimilated to a neighboring consonant to produce a geminate, and afterwards the geminate could have been simplified with compensatory vowel doubling.

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If a consonant is lost as the first component of a posttonic cluster, the stressed vowel may be lengthened. The explanation seems to be that there was metathesis between the second and the third consonants in such words, which then experienced the development described above:

- *rri.t* ('rVrVjtV) "sow" (> 'rijVrtV) > ^{s}ⲣⲁⲁⲣⲉ /'ra:rə/
- *sh3.t* ('sahV3tV) "to bring down" (> 'sa3VhtV) > ^{s}ⲥⲟⲟϩⲉ /'sɔhə/ "to remove"

The retention of *-r-* in ⲣⲁⲁⲣⲉ also presupposes a form (*'rijVrtV) (☞ § 3.14.3.3).

If the second component of the cluster is a glide, there is as a rule no lengthening:

- *mniw* ('mVnViwV) "herdsman" > ^{s}ⲙⲁⲛ̇ⲉ /'manə/
- *ḥf3w* ('ḥafV3wV) "serpent" > ^{s}ϩⲟϥ /'hɔf/
- *tḫi̯.w* ('taḫVi̯wV) "to be drunk (stative)" > ^{s}ⲧⲁϩⲉ /'tahə/

If a consonant (apart from ‹ʿ›) is lost in another position, there is no lengthening:

- *3pd* ('3apdV) "bird" > ^{s}ⲱⲃⲧ /'oβt/
- *ỉr.t* ('ỉirtV) "to do" > ^{s}ⲉⲓⲣⲉ /'irə/
- *w3ḫ* ('wa3ḫV) "to look for" > ^{s}ⲟⲩⲱϣ /'woʃ/
- *pḫ3* ('paḫ3V) "to break" > ^{s}ⲡⲱϩ /'poh/

If ‹ʿ› follows anywhere in the word after the stressed vowel, the stressed vowel is lengthened:

- *mnʿ.t* ('manVʿtV) "nurse" > ^{s}ⲙⲟⲟⲛⲉ /'mɔ:nə/
- *ḥʿ-f* ('ḥaʿfV) "his body" > ^{s}ϩⲱⲱϥ /'ho:f/
- *šʿd* ('šaʿdV) "to cut" > ^{s}ϣⲱⲱⲧ /'ʃo:t/
- *ḏbʿ* ('tubʿV) "finger" > ^{s}ⲧⲏⲏⲃⲉ /'te:βə/

Several scholars (e.g. Vergote 1973/83: Ib, § 36; Loprieno 1995: 44f.) explained this by a metathesis which brought ‹ʿ› closer to the stressed vowel. Perhaps this assumption is not necessary, though. Vowel length is a suprasegmental phenomenon which can be realized on the stressed vowel in a word even if it is motivated by a process at a different position.

Only when preceding the stressed vowel, ‹ʿ› does not cause lenghthening:

- *wʿb* (w[V]'ʿab) "to be clean" > ^{s}ⲟⲩⲟⲡ /'wɔp/

Long vowels are frequently generalized through analogy (cf. Vycichl 1990: 198f.):

- *bin* ('bajnV) "bad (masculine)" ≠ ^{s}ⲃⲱⲱⲛ /'βo:n/
- *bin.t* ('bajVntV) "bad (feminine)" = ^{b}ⲃⲟⲟⲛⲉ /'βɔ:nə/

- *sif* ('sajfV) "to pollute" ≠ ^{s}ⲥⲱⲱϥ /'so:f/
- *sif.w* ('sajVfwV) stative of the same verb = ^{s}ⲥⲟⲟϥ /'sɔ:f/

The plural forms of nouns are frequently characterized by a long vowel in Coptic. In certain cases, this can be explained by the regular sound development rules, e.g.:

- *š3s* ('ša3sV) "bedouin" > ^{s}ϣⲱⲥ /'ʃos/
- *š3s.w* ('ša3VswV) "bedouins" > ^{s}ϣⲟⲟⲥ /'ʃɔ:s/

From such cases, vowel length was extended to plural forms of other nouns such as:

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- *msḥ* (m[V]'sVḥV) "crocodile" > ^{s}ⲙⲥⲁϩ /m̩'sah/
- *msḥ.w* "crocodiles" ≠ ^{s}ⲙⲥⲟⲟϩ /m̩'sɔ:h/

Double vowels are not written in word-final position (☞ § 5.3.4):

- *jʿ.t* ('jaʿtV) "to wash" > ^{s}ⲉⲓⲱ /'jo(:)/

5.6 Development of stressed vowels in specific environments

5.6.1 Development in word-final position

As was explained in detail in § 5.3.4, the inventory of vowels in word-final position resembles the inventory of long vowels rather than that of short vowels in Coptic. The normal outcome of i_{low} in Sahidic is ⲁ word-internally but ⲉ in word-final position. This leads to synchronic alternations in Coptic:

- *n-k* ('nikV) "to you (masc.)" > ^{s}ⲛⲁⲕ /'nak/
- *n-ṯ* ('niṯV) "to you (fem.)" > ^{s}ⲛⲉ /'nɛ/

However, word-final -ⲁ occurs in Sahidic as well. Its etymology is not quite clear (cf. e.g. Osing 1976a: 14-17; Vergote 1973/83: Ib, § 37).

5.6.2 Development before back spirants

5.6.2.1 Overview

There is a tendency for vowels to be lowered before certain back spirants. The following correspondences are attested:

normal development	ⲟⲩ, ⲱ	ⲟ	ⲁ	ⲏ
before back spirant	ⲟ	ⲁ	ⲉ	ⲉ

5.6.2.2 High vowels

There is a tendency for high vowels to be replaced by low vowels before Egyptian *ḥ* (Osing 1976a: 11, 19):

- u_{high} before *ḥ* becomes ⲉ (instead of ⲏ) in Bohairic and mostly also in Sahidic (Semitic **tappūḥ* > ^{b}ϫⲉⲙⲫⲉϩ /cəm'pʰɛh/, ^{s}ϫⲙⲡⲉϩ /cm̩'pɛh/, ^{a}ϫⲙⲡⲏϩ /cm̩'peh/).
- a_{high} before *ḥ* becomes ⲟ (instead of ⲱ/ ⲟⲩ) in Bohairic: *ꜣḥ.t* ('ꜣaḥtV) "field" > ^{b}ⲓⲟϩⲓ /'jɔhi/, ^{s}ⲉⲓⲱϩⲉ /'johə/; *nwḥ* ('nawḥV) "rope" > ^{b}ⲛⲟϩ /'nɔh/, ^{s}ⲛⲟⲩϩ /'nuh/.[293] Before *h*, however, we have the normal development: *nh.t* "sycamore" > ^{b}ⲛⲟⲩϩⲓ /'nuhi/.
- I have no certain example to show how i_{high} developed before *ḥ*.[294]

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[293] For details and a possible exception see Lacau (1965: 9-11).

[294] Cf. Osing (1976a: note 119 on p. 461f.).

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5.6.2.3 Low vowels

In most Coptic dialects, but not in Akhmimic, a_{low} merged with i_{low} (and possibly u_{low}) if one of the consonants ʿ, *ḥ*, *ḫ*, or *ẖ* followed in Egyptian (Osing 1976a: 11). With following *h*, evidence is contradictory (Osing 1976a: note 42 on p. 364; cf. also Vergote 1973/83: Ib, § 36).

Paleo-Coptic	Sahidic, Bohairic	Fayyumic, Mesokemic	Akhmimic
a_{low} (normal)	ⲟ	ⲁ	ⲁ
a_{low} (before back spirant)	ⲁ	ⲉ	ⲁ
i_{low} (and possibly u_{low})	ⲁ	ⲉ	ⲉ[295]

This conditioned sound shift is still recognizable in Coptic from morphophonological alternations. For example, adjective verbs of the type CCⲟC normally form a stative CⲟCC:

- *wmt* "to become thick" > ^{s}ⲟⲩⲙⲟⲧ – stative *wmt.w* > ^{s}ⲟⲩⲟⲙ(ⲛ)ⲧ.

However if the second consonant was originally one of the above mentioned, the stative is CⲁCC:

- *wʿb* "to become clean" > ^{s}ⲟⲩⲟⲡ – stative *wʿb.w* > ^{s}ⲟⲩⲁⲁⲃ
- *nḫt* "to become strong" > ^{s}ⲛϣⲟⲧ – stative *nḫt.w* > ^{s}ⲛⲁϣⲧ

The quality of a_{low} is not changed by ‹ʿ› in distance position, although the vowel is lengthened according to the rules described in § 5.5.10.2:

- *mnʿ.t* "nurse" > ^{s}ⲙⲟⲟⲛⲉ /ˈmɔːnə/, ^{b}ⲙⲟⲛⲓ, ^{f}ⲙⲁⲁⲛⲓ
- *šmʿ.w* "to be fine (stative)" > ^{s}ϣⲟⲟⲙⲉ /ˈʃɔːmə/, ^{b}ϣⲟⲙ

5.6.3 Development after nasals

5.6.3.1 Nasalization of a_{high} *and* i_{high}

There are indications that a late form of Egyptian had subphonemic nasalization of vowels which subsequently fed conditioned sound shifts. After *m* or *n*, a_{high} and i_{high} developed into ⲟⲩ and ⲏ instead of ⲱ and (ⲉ)ⲓ respectively. This is best seen as a development particular to nasalized allophones. The development is suppressed for i_{high} which was simultaneously preceded as well as followed by a nasal consonant. In this case the nasal articulation of the vowel was obviously not maintained. This allows for the conclusion that a preceding nasal consonant tended to provoke nasal assimilation whereas a following nasal consonant tended to provoke nasal dissimilation. The nasalization must have affected at least /i/ in the mid of the 1st century BC, but it might also have

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[295] Osing (1976a: 15) assumes that in some cases i_{low} (and u_{low}) developed into ⲁ before back fricatives in Akhmimic. I think that he was not successful in ruling out the possibility that the vowels in question can originally have been a_{low}.

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been present in earlier and/ or later periods.[296]

The effects of this nasalization are still synchronically evident in Coptic. E.g., verbs belonging to the common verbal type ^{s}CⲱCC (status pronominalis ^{s}CⲟCC-) have ⲟⲩ instead of ⲱ if their first consonant is a nasal: ^{s}ⲙⲟⲩⲕϩ / ^{s}ⲙⲟⲕϩ- “to afflict”.

Evidence is contradictory as to whether nasalization still applied after the loss of ‹ꜣ›:

- *mꜣq.t* (m[V]ˈꜣaqtV) “ladder” > ^{b}ⲙⲟⲩⲕⲓ /ˈmuki/
- *mꜣt.t* (m[V]ˈꜣittV) “parsley” > ^{s}ⲙⲓⲧ /ˈmit/, ^{b}(ⲉ)ⲙⲓⲧ
- *šmꜣy.t* (šVmˈꜣaytV) “alien (feminine)” > ^{s}ϣⲙⲙⲱ /ʃm̩ˈo/ (on this word see Osing 1976a: note 735 on p. 668f.)

This might indicate that not all ‹ꜣ›’s were lost at the same time.

5.6.3.2 Nasalization of the sequence i_{low} *(and* u_{low}*?) + w*

While both above-mentioned developments affect all Coptic dialects, we find effects of another postnasalation which is restricted to Akhmimic and to certain non-literary texts written in abnormal (Akhmimoid) Sahidic: The (standard-)Sahidic diphthong ⲁⲩ normally corresponds to ^{a}ⲉⲩ, but we find ⲟ ~ ⲱ[297] if a nasal consonant precedes.[298] It appears that a nasalized allophone [ɛ̃w] developed into [ɔ] (or [ɔ̃]) whereas non-nasalized [ɛw] was preserved. An example:

- *nwꜣ* (ˈniwꜣV) “to see” > ^{s,b}ⲛⲁⲩ /ˈnaw/, ^{a}ⲛⲟ /ˈnɔ/

Most known examples appear in word-final position which Lacau (1970d) considers substantial. But note the word for “liver” which is attested as ⲙⲁⲟⲩⲥⲉ, ⲙⲁⲟⲩⲥⲓ, and ⲙⲟⲥⲉ in Old Coptic texts. Richter (1998) assigns these forms to predecessors of the Sahidic, Bohairic, and Akhmimic dialects respectively. If this is true, we have an example of the same phonetic correspondences in word-internal position.

5.6.3.3 Further details and exceptions

All these effects even take place if ϩ intervenes between the nasal and the vowel.[299] I have argued in § 3.5.2 that sequences of nasal + ϩ may have been pronounced as nasals with breathy voice:

- *ḏi̯.t + nḥtï* “to trust” > ^{s}ⲧⲁⲛϩⲟⲩⲧ /tanˈhut/ ([taˈn̤ũt]?), ^{b}ⲧⲉⲛϩⲟⲩⲧ “to trust”
- *mꜥḥꜥw.t* “tomb” > ^{s}ⲙϩⲁⲁⲩ /ˈmhaːw/ ([ˈm̤aːw]?), ^{a}ⲙϩⲱ ([ˈm̤ɔ̃]?)

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[296] For the nasalization of /a/ see Vycichl (1984), for the nasalization of /i/ see Peust (1992). For the chronology see Lacau (1970d: 128), Peust (1992: 124), and Vycichl (1984: 395).

[297] On the Akhmimic variation ⲟ~ⲱ in word-final position ☞ § 5.3.4.

[298] See Lacau (1970d), Crum & Winlock (1926: 241), and Sturm (1933: 124).

[299] First recognized by Till (1928: 23). This explanation of ⲟⲩ in Coptic was accepted by Lacau (1970d: 125-129) and Vycichl (1990: 231) who, however, include examples which can also be explained by the shift ⲱ > ⲟⲩ before ⲣ. For i_{high} > ⲏ no example has yet been adduced.

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There are a few exceptions to the developments described above. They concern forms in grammatical paradigms with the Ⲟ–Ⲱ-alternation and can be explained as analogical developments:

- ^{s}ⲤⲚⲰⲰϤ /ˈsnoːf/, plural of ^{s}ⲤⲚⲞϤ /ˈsnɔf/ "blood"
- ^{s}ⲘⲘⲰ-ⲦⲚ /m̩ˈotn̩/ "among you (plural)"
- ^{s}ⲦⲀⲘⲰ-ⲦⲚ /taˈmotn̩/ "to teach you (pl.)" (e.g. Luke 3:7)

The plural form of the possessive pronoun varies in different dialects: It has analogical forms in Akhmimic (ⲚⲰ- "those of..." in accordance with the singular ⲠⲰ- "that of...") and Mesokemic, but ⲚⲞⲨ- with regular vowel change in Sahidic and Bohairic.[300]

Ⲱ in Bohairic which is due to secondary vowel raising before glides (☞ §§ 5.6.6.2 and 5.6.6.3) is not replaced by ⲞⲨ after nasals:

- *n-w* "to them" > ^{s}ⲚⲀⲨ /ˈnaw/, ^{b}ⲚⲰⲞⲨ
- *nḏw* "flour" > ^{s}ⲚⲞⲈⲒⲦ /ˈnɔjt/, ^{b}ⲚⲰⲒⲦ

The change Ⲱ > ⲞⲨ is suppressed in Bohairic if ⲞⲨ /w/ follows:

- *mwt* "to die, to kill" > ^{s}ⲘⲞⲨⲞⲨⲦ /ˈmuwt/, ^{b}ⲘⲰⲞⲨⲦ /ˈmowt/

5.6.4 High vowels before liquids

a_{high} and i_{high} normally develop into Ⲱ and (Ⲉ)Ⲓ respectively, however they become ⲞⲨ and Ⲏ respectively before /j/ and after nasals (☞ § 5.5.7). Before Coptic Ⲣ and Ⲗ, both developments are attested without a clear rule. There are no indications that vowels other than a_{high} and u_{high} experienced specific developments before liquids.

5.6.4.1 a_{high}

Let us consider some examples for a_{high} first.[301]

Native Egyptian words:

- *ꜥrị* "to ascend" (since OK) > ^{s}ⲰⲖ /ˈol/, ^{b}ⲰⲖⲒ "to gather; to contain"
- *pr* "house" (since OK) > ^{s}ϪⲈⲚⲈ-ⲠⲰⲢ /cənəˈpor/, ^{b}ϪⲈⲚⲈ-ⲪⲰⲢ "roof"
- *ḥr* "Horus (god)" (since OK and earlier) > ^{s}ϨⲰⲢ /ˈhor/
- *sr* (*sjr*?) "magistrate" (since OK), cuneiform transcription of the New Kingdom: (*pa*)-*ši-ia-ra*[302] > ^{s,b}ⲤⲒⲞⲨⲢ /ˈsjur/ "eunuch"
- *šr* "to block" (since MK, see Faulkner 1981: 270) > ^{s,b}ϢⲰⲢ /ˈʃor/
- *ḏr.t* "hand" (since OK) > ^{s}ⲦⲰⲢⲈ /ˈtorə/, ^{b}ⲦⲰⲢⲒ

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[300] The plural forms of the possessive pronoun are discussed in detail by Funk (1987: 52-54).

[301] For more examples see Vycichl (1990: 179, 237-239, 242-244).

[302] See Edel (1994a: II, 364) and Vycichl (1983: 185f.).

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Possible Semitic loan words first attested in the New Kingdom:

- *iyr* “stag” (since NK) > ^{s}ⲉ(ⲉ)ⲓⲟⲩⲗ /ə'jul/, ^{b}ⲉⲓⲟⲩⲗ, probably from Semitic **ʔajjal-*, cf. Hebrew אַיָּל “stag” (cf. Hoch 1994: no. 1 and Meeks 1997: 34)
- *sr.t* “thorn” (since NK) > ^{s}ⲥⲟⲩⲣⲉ /'surə/, ^{b}ⲥⲟⲩⲣⲓ[303]
- *gsr* “ring” (since NK) > ^{s}ⲝⲟⲩⲣ /'ksur/, ^{b}ϣϭⲟⲩⲣ (cf. Hoch 1994: no. 523; Vittmann 1996: 444)
- *trr* “to hurry” (since NK) > ^{f}ⲧⲣⲟⲩⲣ /'trur/ (cf. Hoch 1994: no. 532 and Meeks 1997: 54)

Words of unclear etymology first attested in the New Kingdom:

- *qrr* “frog” (since NK) > ^{s}ⲕⲣⲟⲩⲣ /'krur/, ^{b}ⲭⲣⲟⲩⲣ
- *ḏʿrw* “web *or similarly*” (since NK) > ^{b}ⲥⲧⲁ-ϫⲟⲩⲗ /sta'cul/ “spider” (cf. Meeks 1994: 208)

Late Semitic loan words first attested in Demotic:

- Demotic *mḏl* “onion” > ^{s}ⲙϫⲱⲗ /m̩'col/, ^{b}(ⲉ)ⲙϫⲱⲗ~ⲙϫⲟⲩⲗ, cf. Arabic بصل *baṣal* “onion”
- Demotic *krkr* “talent (a weight)” > ^{s}ϭⲓⲛϭⲱⲣ /kʲin'kʲor/, ^{b}ϫⲓⲛϭⲱⲣ, cf. Hebrew כִּכָּר “talent”

5.6.4.2 *u*$_{high}$

The normal development of *u*$_{\text{high}}$ is ⲏ. A vowel ⲏ that can only be derived from *u*$_{\text{high}}$ in accordance with our present knowledge is frequently found before ⲣ, e.g.:[304]

- *irp* “wine” (since OK) > ^{s,b}ⲏⲣⲡ /'erp/, borrowed as ⲟⲣⲡ into Old Nubian
- *mr.w* “to bind (stative)” (since 2nd Intermediate Period) > ^{s,b}ⲙⲏⲣ /'mer/
- *nṯr.w* “gods” (since OK) > ^{s}ⲉⲛⲧⲏⲣ *et var.*
- *r-ḏr-* “all” (since OK) > ^{s,b}ⲧⲏⲣ- /'ter/-
- *ḫpr.t*, a nominal derivation of *ḫpr* “to become” (since OK) > ^{s}ϣⲡⲏⲣⲉ /'ʃperə/, ^{b}ϣⲫⲏⲣⲓ

Although the original *u* is not immediately attested in any of these words since none of them happens to be transcribed in early cuneiform sources, I assume (with Osing 1976a: 19 and note 108 on p. 454 f.) that the development *u*$_{\text{high}}$ > ⲏ was indeed possible before ⲣ.

However there are other words which indicate that *u*$_{\text{high}}$ could also develop into *i* before ⲣ (no clear attestations for ⲗ). Examples:

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[303] Compared to Hebrew סִירִים *sīr-īm* “thorns”, Arabic سروة *sarwa*^{t} “arrow” by Vergote (1945: 141) who, however, assumes a genetic relationship rather than a borrowing from Semitic. I consider Egyptian *sr.t* a borrowing from a form related to the Hebrew word, whereas the Arabic سروة may rather be a derivation of the verb سرا *sarā* (√*srw*) “to throw off (clothes)”.

[304] For more possible examples see Osing (1976a: note 108 on p. 454 f.).

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- *ꜣsjr* “Osiris (god)” (since OK) > Old Coptic ⲟⲩⲥⲓⲣⲉ, borrowed as *ašuri* into Meroïtic from which we can verify that the word actually had *u* in the New Kingdom (cf. Hintze 1973b: 335).
- *mn.t* “swallow” (since OK) appears in two varieties in Bohairic: ⲃⲓⲣⲓ /ˈβiri/ ~ ⲃⲏⲛⲓ /ˈβeni/ (Sahidic only ⲃⲏⲛⲉ /ˈβenə/). ⲏ in ⲃⲏⲛⲉ/ⲓ can only derive from u_{high}. The variety ⲃⲓⲣⲓ then seems to suggest that u_{high} developed into ⲓ before ⲣ.
- *trr* “oven” (since NK) > ^{s}ⲧⲣⲓⲣ /ˈtrir/, ^{b}ⲑⲣⲓⲣ, borrowed from a Semitic word with *-u-*, cf. Hebrew תַּנּוּר “oven” (☞ appendix 5)
- Demotic *gbyr* “left” > ^{s}ϩⲃⲟⲩⲣ /ˈhβur/, ^{l}ϭⲃⲟⲩⲣ /ˈkʲβur/, ^{a}ϭⲃⲓⲣ /ˈkʲβir/. The interdialectal sound correspondences are irregular. I assume that this word was borrowed from an unknown source which had *u*. This vowel was preserved in Sahidic and Lycopolitan, but the Akhmimic form was still affected by the shift *u* > ⲉⲓ. Either the word was borrowed into Akhmimic earlier than into the other dialects (which would point to a Southern origin), or the sound shift u_{high} > ⲏ/ⲉⲓ took place in the predecessor of Akhmimic later than in other parts of the country. A connection to the root **-awur* “left (side)” which Schadeberg (1981: 166) reconstructs for Proto-Heiban (a language family spoken in present-day Sudan) is perhaps possible.

5.6.4.3 A possible interpretation

As far as the development of a_{high} is concerned, it appears that it can develop into either ⲱ or ⲟⲩ before a liquid, but the cited data show that ⲱ is more common in native words and ⲟⲩ is more common in borrowings from Semitic. Data are insufficient to decide whether a similar rule can be proposed for u_{high}.

Although some problems remain, I suggest that the divergent developments of a_{high} and u_{high} reflect foreign phonemes which were used in loan words only. It would thus be possible to assume that there were two vowels each hidden behind what we classify as a_{high} and u_{high}. However I propose another scenario:

The Semitic liquids /r/ and /l/ may have been spoken in a different manner than the corresponding Egyptian liquids. When they were borrowed into Egyptian, the peculiar Semitic pronunciation may have been retained. This is no longer visible in Coptic in the liquids themselves, however the different character of these liquids would then be responsible for specific developments of the preceding vowels. Unaware of the Egyptian evidence, Faber (1989) suggests that the primary realization of /l/ in Proto-Semitic was that of a velarized [ʟ]. She notes that Proto-Semitic /-aw-/ renders *-ô-* in Hebrew but /-law-/ renders *-lû-*. In modern Arabic /l/ usually has a plain articulation, but it is exceptionally velarized in the word *ʔalla:h* الله “God” which Faber plausibly explains as a phonetic archaism. Similar archaisms can also be observed in other items of the Arabic religious vocabulary (e.g. the term *qurʔa:n* قرآن “Quran” never participates in the sound shift /q/ > /ʔ/ common in Modern Arabic).

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It is possible that /r/ also had a velarized pronunciation in earlier Semitic. It is a curious fact that in many modern Arabic dialects vowels have velarized allophones not only in the neighborhood of the so-called emphatic consonants, but frequently also in the vicinity of *r* (Fischer & Jastrow 1980: 56f.).
A velarized pronounciation of the Semitic liquids would easily explain why a_{long} developed into ⲟⲩ rather than into ⲱ in their neighborhood.

In sum, I consider it possible that Late Egyptian imported two velarized liquids for use in Semitic loan words. These liquids contrasted with two native liquids /r/ and /l/, which might have had a somewhat palatal articulation. This assumption can be supported by the fact that Egyptian liquids had a tendency to develop into /j/: One of the Egyptian liquids, namely ‹ꜣ› (=/r/), regularly merged with /j/ shortly before the New Kingdom (☞ § 3.14.2.1). The liquid(s) written as ‹r› were commonly retained as liquids, however occasional developments towards /j/ seem to be attested, although evidence is not certain in this point (☞ §§ 3.13.5 and 3.14.3.7).
Compare also the possible existence of velarized and palatalized allophones of sonorants in Bohairic (☞ §§ 3.17.3 and 3.17.4).

5.6.5 Low vowels before sonorants

Before sonorants (ⲃ, ⲗ, ⲙ, ⲛ, ⲣ), i_{low} (and possibly u_{low}) is frequently absorbed in Coptic, which leads to the formation of syllabic sonorants. This is discussed in detail in § 5.10.

5.6.6 Development before glides

There is a tendency for vowel quality to change before glides. With the exeption of the development i_{high} > ⲏ before /j/, which is a dissimilation, all of these cases can be interpreted as vowel raising.

5.6.6.1 High vowels before j

In all Coptic dialects, high vowels show a specific development before -ⲓ /j/, which is the same as after nasals: a_{high} > ⲟⲩ, i_{high} > ⲏ. Examples for a_{high}:

- *(pr-)ꜥꜣ.w* “pharaohs” > $^{\text{m}}$ⲉⲣⲟⲩⲓ /ə'ruj/ “kings” (Mesokemic form from Mink 1995: 65)
- *ḥfꜣy.w* “snakes” > $^{\text{s,b}}$ϩⲃⲟⲩⲓ /'hfuj/
- *sbꜣ.wj* (s[V]b'ꜣawjV) “disciple” > $^{\text{s}}$ⲥⲃⲟⲩⲓ /'sβuj/
- *gꜣw* “narrow” ('gaꜣwV) > $^{\text{s}}$ⲕⲟⲩⲓ /'kuj/[305] (Bohairic ⲕⲟⲩϫⲓ /'kuci/ must be a secondary development from this)

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[305] For the etymology see Osing (1976a: note 602 on p. 608f.) and Vycichl (1983: 73).

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ⲱⲓ is preserved in Bohairic 1) if -ⲓ is vocalic instead of consonantal (*iʿ.t* "to wash" > ^{b}ⲓⲱⲓ /ˈjoi/, cf. ^{l}ⲓⲱⲉ /ˈjoə/), 2) if ⲱⲓ corresponds to Sahidic ⲟⲓ (☞ §§ 5.6.6.2 and 5.6.6.3).

For i_{high}, no certain examples can be adduced. The sequence */ij/ is, however, not attested in Coptic, from which I conclude that i_{high} before *j* must have developed into ⲏ. Note further Osing (1976a: 21-26).

5.6.6.2 *Raising of low vowels before pre-consonantal glides in Bohairic*

An original low vowel frequently changes into a high vowel in Bohairic if a glide (/j/ or /w/) follows within the same syllable (i.e.: if the glide is followed by a consonant).[306] The resulting correspondences are as follows:

	+/j/	+/w/
a_{low} (^{s,b}ⲟ)	^{s}ⲟ(ⲉ)ⲓ, ^{b}ⲱⲓ	^{s}ⲟⲟⲩ, ^{b}ⲱⲟⲩ
i_{low} (^{s,b}ⲁ)	^{s}ⲁ(ⲉ)ⲓ, ^{b}ⲏⲓ	^{s}ⲁⲩ, ^{b}ⲱⲟⲩ

The central low vowel ⲁ seems to shift to a front or back high vowel depending on whether a front or back glide respectively follows.[307]

- *iwšš* "gruel" > ^{s}ⲟⲟⲩϣ /ˈɔwʃ/, ^{b}ⲱⲟⲩϣ /ˈowʃ/
- *bin.t* "harp" > ^{s}ⲃⲟⲉⲓⲛⲉ /ˈβɔjnə/, ^{b}ⲟⲩⲱⲓⲛⲓ /ˈwojni/
- *h3nw* "wave" > ^{s}ϩⲟⲉⲓⲙ, ^{b}ϩⲱⲓⲙⲓ
- *ẖ3bs* "shadow" > ^{s}ϩⲁⲉⲓⲃⲉⲥ, ^{b}ϧⲏⲓⲃⲓ
- *swḥ.t* "egg" > ^{s}ⲥⲟⲟⲩϩⲉ, ^{b}ⲥⲱⲟⲩϩⲓ

If the glide is followed by a vowel (so that it forms the onset of the following syllable), the shift does not take place:

- *m3wṯ* "to think" > ^{s}ⲙⲉⲉⲩⲉ /ˈmɛːwə/, ^{b}ⲙⲉⲩⲓ /ˈmɛwi/
- *k3-ḥr-k3* (name of a feast, later of a month) > ^{s}ⲕⲟⲓⲁϩⲕ /ˈkɔjahk/, ^{b}ⲭⲟⲓⲁⲕ /ˈkʰɔjak/
- *dw3w* "morning" > ^{s}ϩ-ⲧⲟⲟⲩⲉ (the etymology of ϩ- is disputed), ^{b}ⲧⲟⲟⲩⲓ
- *djw.t* "50" > ^{s,b}ⲧⲁ(ⲉ)ⲓⲟⲩ

Vowel raising before glides is no longer synchronically productive in Bohairic. Diphthongs with low vowels are therefore retained in borrowings from Greek, as well as when they developed through a late metathesis:

- *šnw.t* "granary" (> */ˈʃɛnwi/) > ^{b}ϣⲉⲩⲛⲓ /ˈʃɛwni/[308]

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[306] Detailed rules are given below. Earlier scholars have formulated these rules somewhat differently, cf. Loprieno (1995: 47), Osing (1976a: 11, 15), Vergote (1973/83: Ia, § 46), Vycichl (1954: 189).

[307] Another possibility would be to assume that the central low vowel shifts to a central high vowel (ɨ), and the sequences [ɨj] and [ɨw] are graphically expressed by ⲏⲓ and ⲱⲟⲩ respectively.

[308] For the date of the metathesis in this word cf. Osing (1976a: note 71 on p. 383-386).

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The nominal plural suffix ^{s}-ⲟⲟⲩⲉ, ^{b}-ⲱⲟⲩⲓ is irregular. I assume that its form has been subject to analogical influence:[309]

- *wnw.wt* "hours" > ^{s}ⲟⲩⲛⲟⲟⲩⲉ /u'nɔwə/, ^{b}ⲟⲩⲛⲱⲟⲩⲓ /u'nowi/
- *ṯbw.t* "sandals" > ^{s}ⲧⲟⲟⲩⲉ /'tɔːwə/, ^{b}ⲑⲱⲟⲩⲓ /'tʰowi/

Another word with difficult correspondences, which does not agree with my rules, is *qrs.t* "burial" > ^{b}ⲕⲁⲓⲥⲓ, ^{s}ⲕⲁⲓⲥⲉ~ⲕⲁⲉⲓⲥⲉ~ⲕⲉⲓⲥⲉ~ⲕⲉⲥⲉ, ^{a}ⲕⲉⲉⲥⲉ, ^{f}ⲕⲉⲏⲥⲓ~ⲕⲏⲓⲥⲓ, Old Coptic ⲕⲁⲏⲥⲉ. The Fayyumic and Old Coptic variants seem to suggest that the Bohairic form is to be read /ka'isi/ rather than /'kajsi/.

5.6.6.3 Raising of low vowels before word-final glides in Bohairic

Vowel raising is not regular in word-final position. In connected speech, a word-final glide can be either syllable-initial or syllable-final, depending on whether the following word begins with a vowel or with a consonant. But such a synchronic variation is not found in Bohairic; rather, one of both possible solutions was generalized to all occurrences of a given word.[310] Cf.:

Vowel raising:

- *ʿrj* "to mount" > ^{s}ⲁⲗⲉ /a'lɛ/, ^{b}ⲁⲗⲏⲓ /a'lej/
- *mw* "water" > ^{s}ⲙⲟⲟⲩ /'mɔw/, ^{b}ⲙⲱⲟⲩ /'mow/
- *ḥwꜣ.w* "to be bad (stative)" > ^{s}ϩⲟⲟⲩ, ^{b}ϩⲱⲟⲩ
- *ḥrj* "top" > ^{s}ϩⲣⲁⲓ, ^{b}ϩⲣⲏⲓ

No vowel raising:

- *ꜥꜣ* "to be big", by reduplication: *ꜥꜣꜥꜣ* (cf. Wilson 1997: 133) > ^{s,b}ⲁⲓⲁⲓ /a'jaj/
- *pꜣi* (demonstrative pronoun) > ^{s}ⲡⲁⲓ /'paj/, ^{b}ⲫⲁⲓ /'pʰaj/
- *pj* "seat" > ^{s}ⲡⲟⲓ /'pɔj/, ^{b}ⲫⲟⲓ /'pʰɔj/
- *hrw* "day" > ^{s}ϩⲟⲟⲩ, ^{b}ⲉϩⲟⲟⲩ[311]

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[309] This plural suffix, which in Coptic can be attached to nouns of either gender, can be traced back to the Egyptian female plural ending *-wt*. It is probable that the Bohairic form -ⲱⲟⲩⲓ was influenced by the plurals in ^{s,b}-ⲱⲟⲩ (e.g. ^{s,b}ⲣⲱⲟⲩ "mouths" from ^{s,b}ⲣⲟ "mouth") which are peculiar to masculine nouns.

[310] As for the equivalent of Sahidic -ⲟⲟⲩ, Lacau (1902: 202-205 and 1910: 78) suggests that Bohairic has a high vowel if Sahidic has a short /ɔ/, but a low vowel if Sahidic has a long /ɔː/ (adapted to my terminology). This assumption was accepted by Hintze (1953: 31 and 1980: 49) and Loprieno (1995: 44). I do not see sufficient evidence for this claim; note also the counterexample *ṯbw.t* ('ṯabVwtV) "sandal" > ^{s,a}ⲧⲟⲟⲩⲉ /'tɔːwə/, ^{b}ⲑⲱⲟⲩⲓ /'tʰowi/.

[311] The etymology of ⲉ- is obscure. The Bohairic word for "night" ⲉϫⲱⲣϩ has a secondary ⲉ- as well (Egyptian *grḥ*, Sahidic ϭⲱⲣϩ, a Bohairic form ϫⲱⲣϩ is also attested). I suggest that the prosthetic vowel before both time expressions is to be identified with -ⲉ- which in Sahidic regularly intervenes between the definite article and expressions of time such as ^{s}ϩⲟⲟⲩ "day" and ^{s}ⲣⲟⲙⲡⲉ "year" and is traditionally analysed as a part of the article in this dialect (cf. Depuydt 1993: 369-375).

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- *skꜣ* "to plough" > ^{s}ⲥⲕⲁⲓ, ^{b}ⲥⲭⲁⲓ
- *šꜣw* "value" > ^{s,b}ϣⲁⲩ
- *tꜣšj.w* "neighbors" > ^{s}ⲧⲉϣⲉⲉⲩ, ^{b}ⲑⲉϣⲉⲩ

If suffix pronouns are added to a word, the changes to -ⲏⲓ and -ⲱⲟⲩ do apply, but -ⲟⲓ is retained:

- *m-im-w* "in them" > ^{s}ⲙⲙⲟⲟⲩ, ^{b}ⲙⲙⲱⲟⲩ
- *m-im-j* "in me" > ^{s,b}ⲙⲙⲟⲓ
- *m-im-f* "in him" > ^{s,b}ⲙⲙⲟϥ

- *ḏi̯.t ꜥmi̯-w* "to let them know" > ^{s}ⲧⲁⲙⲟⲟⲩ, ^{b}ⲧⲁⲙⲱⲟⲩ
- *ḏi̯.t ꜥmi̯-j* "to let me know" > ^{s,b}ⲧⲁⲙⲟⲓ
- *ḏi̯.t ꜥmi̯-f* "to let him know" > ^{s,b}ⲧⲁⲙⲟϥ

- *n-w* "to them" > ^{s}ⲛⲁⲩ, ^{b}ⲛⲱⲟⲩ
- *n-j* "to me" > ^{s}ⲛⲁⲓ, ^{b}ⲛⲏⲓ
- *n-f* "to him" > ^{s,b}ⲛⲁϥ

- *pꜣ ḏd-w* "(is) what they said" > ^{s}ⲡⲉϫⲁⲩ, ^{b}ⲡⲉϫⲱⲟⲩ "so said they"
- *pꜣ ḏd-j* "(is) what I said" > ^{s}ⲡⲉϫⲁⲓ, ^{b}ⲡⲉϫⲏⲓ "so said I"
- *pꜣ ḏd-f* "(is) what he said" > ^{s,b}ⲡⲉϫⲁϥ "so said he"

An exception is:

- *ḫꜣꜥ-w* "to put them" > ^{s}ⲕⲁⲁⲩ /'ka:w/, ^{b}ⲭⲁⲩ /'kʰaw/
  (*ḫꜣꜥ-j* "to put me" has been replaced by a new formation ^{s}ⲕⲁⲁⲧ, ^{b}ⲭⲁⲧ)

5.6.7 Possible cases of early vowel umlaut triggered by a following *j*

5.6.7.1 *The facts*

Coptic verbs can be divided into several classes according to the form of their infinitive. Let us consider here only verbs with originally three consonants which is the most common type in Egyptian. Most of these verbs belong to one of the following classes:[312]

Coptic verbal class	Paleo-Coptic reconstruction (new)	Paleo-Coptic reconstruction (traditional)	example from Sahidic
CⲱCC	'CaCCV	'Ca:CVC	ⲥⲱⲧⲙ /'sotm̩/ < *sḏm* "to hear"
CCⲟC	C(V)'CaCV	CV'CaC	ⲙⲧⲟⲛ /m̩'tɔn/ < *mdn* "to rest"
CⲓC(ⲉ)	'CiCCV	'Ci:CVC	ⲟⲩⲓⲧⲉ /'witə/ < *wḏꜣ* "to go away"
CCⲁC	C(V)'CiCV	CV'CiC	ⲥⲕⲁⲓ /'skaj/ < *skꜣ* "to plough"

---

[312] See Till (1955: §§266-273), Fecht (1955), Osing (1976a: 36-63). There are a few more classes (CⲁCⲉ, CCⲏC) which are left out of discussion here.

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We can see that the four classes as reconstructed for Paleo-Coptic differ with respect to two parameters, namely 1) the position of the stressed vowel (before or after the second consonant) and 2) the quality of the stressed vowel (*a* or *i*). The stress position, i.e. the opposition between the classes CⲱCC and CⲓC(ⲉ) on the one hand and CCⲟC and CCⲁC on the other, seems to be determined by semantic criteria (Aktionsart) to at least an extent (Fecht 1955: 288). The vowel quality, i.e. the opposition between the classes CⲱCC and CCⲟC on the one hand and CⲓC(ⲉ) and CCⲁC on the other, seems to be largely predictable from the third consonant the verb had in Egyptian, although exceptions remain. The *a*-classes are generally more common, but we can observe that verbs with *ꜣ* as the third consonant preferably belong to one of the *i*-classes. The verbs with *ꜣ* as the third consonant are discussed by Fecht (1955). Some examples:

- *wḏꜣ* "to go away" > ^{s}ⲟⲩⲉⲓⲧⲉ /ˈwitə/, ^{b}ⲃⲓϯ "to waste away"
- *wḏꜣ* "to prosper" > ^{s,b}ⲟⲩϫⲁⲓ /u'caj/
- *bgꜣ* "shipwrecked" > ^{b}ⲃⲓϫⲓ /ˈβici/, ^{l}ⲃⲓϭⲉ "to be wrecked"
- *mḫꜣ* "to attack" > ^{s}ⲙⲓϣⲉ /ˈmiʃə/, ^{b}ⲙⲓϣⲓ
- *sgꜣ* "to become rigid" > ^{s}ⲥⲓϭⲉ /ˈsikʲə/
- *qmꜣ* "to throw" >^{s,b}ⲕⲓⲙ /ˈkim/ "to move"
- *ḏdꜣ* "to grow fat" > ^{s}ϫⲧⲁⲓ /ˈctaj/ "to grow"

Only a few such verbs belong to one of the *a*-classes, e.g.:

- *wḫꜣ* "to search" > ^{s,b}ⲟⲩⲱϣ /ˈwoʃ/ "to wish"
- *pgꜣ* "to open" > ^{s}ⲡⲱϭⲉ /ˈpokʲə/, ^{b}ⲫⲱϫⲓ "to break"
- *ḏbꜣ* "to repay" > ^{s}ⲧⲱⲱⲃⲉ /ˈtoːβə/, ^{b}ⲧⲱⲃ

The *i*-type is also the normal development of verbs with *i̯* as third consonant, which will not be discussed here because of their peculiar problems.[313]

5.6.7.2 *A possible interpretation*

To date, no explanation has been suggested why verbs with *ꜣ* as final consonant preferably belong to the *i*-class (cf. Fecht 1955: 402). It seems probable that the *i*-vocalization has emerged by a phonetic process. I suggest that many or perhaps all of the later *i*-verbs originally had *a*, but the vowel was changed to *i* if *ꜣ* followed either directly or separated by another consonant:

- ⲟⲩϫⲁⲓ "to prosper" < *wḏꜣ* (w[V]'ḏiꜣV) < *(w[V]'ḏaꜣV)
- ⲟⲩⲓⲧⲉ "to go away" < *wḏꜣ* ('wiḏꜣV) < *('waḏꜣV)

I cannot estimate at present to what degree this sound change was bound to additional conditions. But it must obviously have operated at a time when ‹ꜣ› had the sound value /j/. This might have been approximately during the 2nd Intermediate Period (☞ § 3.14.2.1).

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[313] Remember that *i̯* is a notation for a reconstructed /j/ which is not usually written in Egyptian. Verbs which are assumed to belong to this type form their infinitive with a *t*-suffix in Egyptian. It is not quite clear whether the suspected *i̯* was present in the infinitive or not.

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It should be noted that in verbs of the CⲓC(ⲉ)-class this assimilation can only be explained in the framework of the revised syllable structure rules. According to the traditional rules, CⲓC(ⲉ) would be derived from 'Ca:CVj where it is difficult to see how *-j* should have modified the distant stressed vowel. From our reconstruction 'CaCjV Coptic CⲓC(ⲉ) is easier to explain.

It is a common phenomenon in the development of languages that the sequence of consonant + *j* has a palatalizing effect on a preceding vowel. This phenomenon, which is called "umlaut", is well attested e.g. in several Germanic languages, including English. For example, the verb "to set" derives from *satjan* which is still attested as such in Gothic. Umlaut *a* > *e* took place in all more recent representatives of the Germanic branch, e.g. Old Norse *setja*, Modern English *set*, Modern German *setzen*. But umlaut is also found in other languages such as Latin (cf. *Sicu̱l-us* "Sicilian" but *Sici̱l-ia* "Sicily"), Czech (cf. *pama̱tovat se* "to remember" but *pamě̱t'* "memory", ‹t'› = /tʲ/), or Spanish (cf. Latin *bāsium* "kiss" = */'basjũ/ or similar in Vulgar Latin > modern Spanish *beso* "kiss"). In some languages, we have evidence that the glide was brought in contact with the vowel by metathesis before the vowel itself was subject to change, cf. Latin *paria* "equal ones (neutr. plur.)" > Old French *paire* /'pai̯rə/ > Modern French *paire* /pɛr/ "pair"; Pre-Greek **ban-jo:* > Ancient Greek βαίνω /'bai̯no:/ "I go" > Modern Greek βαίνω /'vɛnɔ/.

Perfective active participles are no longer a productive category in Coptic, nevertheless some of them still exist in a lexicalized form. Although their most common type is CⲱCC (conventionally < 'Ca:CVC), it appears from the data given by Osing (1976a: 120-146) that especially verbs with *i̯* or *ꜣ* as a third consonant had forms in CⲓCC (conventionally < 'Ci:CVC). Here the same argumentation applies as it does to the infinitives.

5.7 Nasal vowels

5.7.1 Subphonemic nasalization of vowels after *m* and *n*

The Egyptian vowels experienced specific developments by the time of Coptic if they followed one of the nasal consonants *m* or *n*. A good explanation for this seems to be that vowels had nasalized allophones after nasal consonants, and these nasalized vowels developed differently from non-nasalized vowels. I have discussed the phenomenon in more detail in § 5.6.3. The nasalization seems to have been present during the 1st millennium BC (and possibly also during other periods) and was not regionally limited.

In addition to this diachronic evidence, we also have synchronic indications of nasalized allophones from Coptic itself. If one of the consonants ⲙ or ⲛ precedes a vowel, an additional unetymological ⲛ can occasionally be written after this vowel. This additional ⲛ certainly serves to express the nasality of the vowel.[314] Cf. the following examples

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[314] But Ranke (1908) assumes that -ⲛⲧ- might represent [d] in these words.

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(from Kahle 1954: I, 103):

- *md.t* “to speak” > ^{a}ⲙⲟⲩⲧⲉ~ⲙⲟⲩⲛⲧⲉ /'mutə/ = ['mũtə] (Sahidic ⲙⲟⲩⲧⲉ)
- *nṯr* “god” > ^{a}ⲛⲟⲩⲧⲉ~ⲛⲟⲩⲛⲧⲉ /'nutə/ = ['nũtə] (Sahidic ⲛⲟⲩⲧⲉ)
- The stative of *smꜣʿ* “to bless” > ^{s}ⲥⲙⲟⲩ is normally ^{s,l}ⲥⲙⲁⲙⲁⲁⲧ, but a rare by-form ⲥⲙⲁⲙⲁⲁⲛⲧ is also attested in Lycopolitan and Sahidic (/sma'ma:t/ = [sma'mã:t]).

The status pronominalis of *mr.t* “to love”, Sahidic ⲙⲉⲣⲓⲧ-, has an additional nasal which is not etymologically justified both in Bohairic (ⲙⲉⲛⲣⲓⲧ-) and in the papyrus Bodmer 6 (ⲙⲛⲣⲓⲧ-). It is possible that these are also renderings of nasalized vowels.

There is a Bohairic writing ⲭⲓⲙⲁⲛⲣⲟⲥ for the Greek word χείμαρρος “torrent” (cf. Girgis 1967/68: 79). The word for “midwife”, Coptic ^{s}ⲙⲉⲥⲓⲱ /məs'jo/, is attested as μενσιω in Greek transcription (Lüddeckens & Thissen 1980ff.: I, 1066). The Coptic names of the letters ⲙ and ⲛ, which were something like /mi/ and /ni/ at that time (μυ, νυ in Greek), were recorded by Bernard de Breydenbach in his *Relatio sanctarum peregrinationum* (1486) as *men* and *nyn* respectively (☞ § 2.7.3). He probably used the letter combinations *-en* and *-yn* to express nasalized vowels.

5.7.2 Nasal vowels in southern Coptic dialects

In certain Lycopolitan texts, vowels are regularly written double before the sequence ⲛ + consonant (cf. Lacau 1910: 80, Till 1929: 189, Hodge 1981: 662f., Kasser 1986). For example, the verb *ʿnḫ* “to live” > ^{s}ⲱⲛϩ, ^{a}ⲱⲛⳉ, ^{b}ⲱⲛϧ appears as ^{l}ⲱⲱⲛϩ, rarely even as ^{l}ⲱⲱϩ (Kasser 1986: 179f.). Since the Coptic double vowels were traditionally interpreted as indications of a glottal stop, no satisfying explanation of the phenomenon has been found to date. As I assume that double vowels note vowel length, the easy explanation comes to mind that the consonant /n/ was weakened to a feature [nasalization] which induced compensatory vowel lengthening. ⲱⲱ(ⲛ)ϩ was probably spoken something like ['õ:x].

Lacau (1910: 80, note 6) remarks that no vowel doubling takes place before -ⲛϩ with ^{l}ϩ corresponding to ^{a,b}ϩ rather than to ^{a}ⳉ, ^{b}ϧ. In this case, ⲛϩ was probably not realized as a consonant cluster but as a single nasal with breathy voice [n̤] (☞ § 3.5.2).

The interrogative pronoun ^{s}ⲧⲱⲛ, ^{b}ⲑⲱⲛ (< *ṯnw*) “where” is written ⲧⲟ ~ ⲧⲱ in Akhmimic and ⲧⲟ ~ ⲧⲟⲟ ~ ⲧⲟⲛ in Lycopolitan. It is possible that a nasalized vowel was spoken in this word: ['tɔ̃(:)].

For possible nasal vowels in the dialect of the Papyrus Bodmer 6 ☞ also § 5.2.3.4.

5.7.3 Other possible examples of nasal vowels

In certain late Sahidic texts, original syllabic nasals can be graphically rendered by ⲉ (☞ § 5.10.8). Vycichl (1934: 735f.) assumes that ⲉ denotes a nasalized vowel in this case.

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Based on Greek transcriptions such as Χεφρην of the royal name *Ḫ*ꜥ*i̯-f-R*ꜥ and the development of the conjugational prefix of the terminative tense (on this ☞ also § 3.6.4.4), Ray (1978) argues that subphonemic nasalization could appear in the environment of ‹ꜥ›. Considering the difficult phonetic plausibility, further evidence would be necessary to accept this claim.

☞ also note in § 5.5.2.

5.8 Unstressed vowels

5.8.1 General remarks

Unstressed syllabic sonorants are not discussed in this section but in § 5.10.

The inventory of vowels in unstressed position is comparatively restricted in Coptic. Long vowels never appear in unstressed position, and the set of short vowels is clearly reduced. Furthermore, not even all vowel quality differences which exist in Coptic unstressed syllables are ancient. The quality of unstressed vowels was frequently determined by former adjacent consonants which are no longer visible as such in Coptic. Egyptian /ʕ/ tends to produce an *a*-coloring, /j/ an *i*-coloring, and /w/ an *u*-coloring.

These rules do not apply to borrowings from Greek where the unstressed vowels of the source language are often retained, at least in writing. But sometimes there are adaptations such as καταβολή > ⲕⲁⲧⲁⲃⲟⲩⲗⲏ “payment” (Girgis 1965-1966: 81) (unstressed ⲟⲩ exists in Coptic, unstressed ⲟ does not) or συμφωνεῖν > ⲥⲙⲫⲱⲛⲉⲓ /sm̥phoni/ (stressed on the penult?) “to agree” (Girgis 1965-1966: 80). On the other hand, there are graphical hypercorrections such as κιβωτός > ⲕⲟⲓⲃⲱⲇⲟⲥ “ark” (Girgis 1965-1966: 79).

Since vowels are not written in the Egyptian scripts, it is difficult to estimate the vowel inventory of unstressed syllables for Pre-Coptic stages of Egyptian. The early Egyptologists projected the state as evident from Coptic into the earlier language and more or less assumed that only /ə/ appeared in unstressed position (e.g. Sethe 1899-1902: § 16). However the retrieval of cuneiform transcriptions from the New Kingdom, although by no means straightforward to interpret, seemed to indicate that the inventory of unstressed vowels was somewhat larger at that time. Alongside with etymological considerations, this led to the now prevalent opinion that at the Paleo-Coptic stage the same number of vowel qualities were distinguished in unstressed syllables as in stressed syllables, namely /a/, /i/, and /u/ (thus e.g. Sethe 1923: 176f., Sturm 1934, Edel 1954: 37-40, Fecht 1960: § 423, Schenkel 1990: 91f., Loprieno 1995: 35, Zeidler 1995: 233; but cf. Knudsen 1962: 199). At least as far as unstressed vowels in word-initial position are concerned, this can be corroborated by a historical-comparative analysis of the Coptic dialects (☞ § 5.8.3).

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5.8.2 Insertion of a subphonological ⲉ in contact with sonorants

In Coptic unstressed syllables, ⲉ frequently appears in the neighborhood of sonorants and seems to be more or less predictable here, i.e. it is of little phonological significance. This topic has been dealt with by Polotsky (1933), Ernštedt (1986: 85-96 and 114-116), and Depuydt (1993: 364-367), ☞ also § 2.7.5. On the historical background of these epenthetic vowels ☞ also § 4.8.1. I do not give exact rules for the placement of ⲉ here but only mention the tendency for it to precede the sonorant in Bohairic and to follow it in Akhmimic and Sahidic. Cf.:

- *ẖrẖr* "to destroy" > ^{b}ϣⲟⲣϣⲉⲣ /ˈʃɔrʃ[ə]r/, ^{a}ϩⲁⲣϩⲣⲉ /ˈxarxr[ə]/ (Sahidic ϣⲟⲣϣⲣ /ˈʃɔrʃr̩/).
- *sḏm* "to hear" > ^{b}ⲥⲱⲧⲉⲙ /ˈsot[ə]m/, ^{a}ⲥⲱⲧⲙⲉ /ˈsotm[ə]/ (Sahidic mostly ⲥⲱⲧⲙ /ˈsotm̩/)
- *ṯms-f* "to bury him" > ^{s}ⲧⲟⲙⲥϥ ~ ⲧⲟⲙⲉⲥϥ /ˈtɔm[ə]sf/

In Akhmimic, a predictable, non-phonological -ⲉ regularly appears at the end of words which terminate in Sahidic in the sequence consonant + sonorant or long (= double) vowel + sonorant:

- *sḏm* "to hear" > ^{s}ⲥⲱⲧⲙ, ^{a}ⲥⲱⲧⲙⲉ /ˈsotm/ [ˈsotmə]
- *ṯrm* "to twinkle" > ^{s}ϫⲱⲣⲙ, ^{a}ϫⲱⲣⲙⲉ

This rule leads to morphological alternations. For example, the suffix pronoun of the 1st person pl. appears both as -ⲛ (e.g. ⲛⲉ-ⲛ /ˈnɛ-n/"to us") and as -ⲛⲉ (e.g. ϭⲛⲧ-ⲛⲉ /ˈkʲn̩t-n[ə]/ "to find us", ⲧⲉⲉ-ⲛⲉ /ˈtɛː-n[ə]/ "to give us").

If a word terminates in three consonants the last two of which are sonorants, no -ⲉ is added (cf. Hintze 1980: note 70 on p. 77). The sonorant before the last probably served as a syllable nucleus in this case:

- Demotic *glmlm* "to wrap" > ^{s}ϭⲗⲟⲙⲗⲙ, ^{a}ϭⲗⲁⲙⲗⲙ (probably /ˈkʲlaml̩m/).

5.8.3 Word-initial unstressed vowels

I have examined the development of word-initial unstressed vowels on the way to Coptic in Peust (1995). All Coptic dialects allow for ⲁ-, ⲉ-, and ⲟⲩ- to appear in unstressed word-initial position, with much variation across the dialects as far as ⲁ- and ⲉ- are concerned. We can thus establish six classes of correspondences:

	class 1	class 2	class 3	class 4	class 5	class 6
Bohairic	ⲁ-	ⲁ-	ⲁ-	ⲉ-	ⲉ-	ⲟⲩ-
Fayyumic	ⲁ-	ⲁ-	ⲁ- ~ ⲉ-	ⲁ- ~ ⲉ-	ⲉ-	ⲟⲩ-
Sahidic	ⲁ-	ⲁ-	ⲉ-	ⲉ-	ⲉ-	ⲟⲩ-
Akhmimic and Lycopolitan	ⲁ-	ⲉ- ~ ⲁ-	ⲉ-	ⲉ-	ⲉ-	ⲟⲩ-
example from Sahidic	ⲁⲡⲉ /aˈpɛ/ "head"	ⲁⲩⲁⲛ /aˈwan/ "color"	ⲉⲃⲟⲧ /əˈβɔt/ "month"	ⲉⲣⲱⲧⲉ /əˈrotə/ "milk"	ⲉⲥⲱ /əˈso/ "sheep"	ⲟⲩϩⲟⲣ /uˈhɔr/ "dog"

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The possibility cannot be excluded that some or all Coptic dialects possess more vowel distinctions on the phonological level than is expressed in writing.

The historical developments can be summarized as follows:

- Classes 1 and 2 appear where the word either began with ‹ꜥ› + any vowel, or with the sequence ‹ỉ› or ‹ꜣ› + *a* at the Paleo-Coptic stage. Class 2 is the result of palatal umlaut induced by Paleo-Coptic *i* in the nucleus of the stressed syllable.
- Class 4 is to be derived from ‹ỉ›/‹ꜣ› + *u*, class 5 from ‹ỉ›/‹ꜣ› + *i*.
- Class 6 is the outcome of ‹w› + any vowel.
- Words of class 3 originally had ‹ỉ›/‹ꜣ› + *a* + a labial consonant, where *a* seems to have been assimilated to *u* by the following labial in the predecessors of all dialects except Bohairic. This assimilation was probably subject to still another condition which is not yet known.

5.8.4 Word-internal unstressed vowels

I will not give a detailed picture for all Coptic dialects here, but it can generally be stated that all dialects have ⲉ /ə/, ⲁ /a/, (ⲉ)ⲓ /i/, and ⲟⲩ /u/ in word-internal unstressed position. Some interdialectal variation occurs here as well.

ⲉ frequently appears as a non-phonological vowel written in the neighborhood of sonorants, ☞ § 5.8.2. ⲁ, (ⲉ)ⲓ, and ⲟⲩ usually appear as a result of former adjacency to /ʕ/, /j/, and /w/ respectively, but only if there was a morphological boundary in the earlier language (cf. also the relationship of ⲧⲉⲩⲛⲟⲩ and ⲧⲉⲛⲟⲩ, ☞ § 3.14.2.6 and note in § 3.2.4). Some examples from Sahidic:

- ⲧⲁⲙⲟ /ta'mɔ/ "to inform" < *ḏi̯ ꜥmi̯* "to cause to know" (ⲁ because of Egyptian ꜥ)
- ϭⲓⲛ- /kʲin-/ (nominal prefix) < *qi n* "form of" (ⲓ because of Egyptian *i*).
- ⲧⲟⲩⲉⲓⲟ /tu'jɔ/ "to remove" < *ḏi̯ wꜣi̯* "to cause to be far" (ⲟⲩ because of Egyptian *w*)

In a few cases, ⲁ seems to arise in the neighborhood of ϩ /h/ < ‹ḥ› or ‹ḫ› (not ϩ < ‹h›), e.g.[315]

- *ḥkꜣw* "magician" > ϩⲁⲕⲟ /ha'kɔ/
- *ꜥnḫ* "to live" > ^{f}ⲱⲛⲁϩ /'onah/ (phonological status of *-a-* doubtful)

In addition, there are a few more words, most of which belong to the adjective type Cⲁ'Cⲉ, in which word-internal unstressed ⲁ appears without obvious reason (cf. Till 1948/49: 16), e.g.:

- ^{s}ⲕⲁⲙⲉ /ka'mɛ/, ^{b}ⲭⲁⲙⲉ "black" < *kmm*
- ^{s,b}ⲥⲁⲃⲉ /sa'βɛ/ "wise" < *sbꜣ*
- ^{s}ⲥⲁⲉⲓⲉ /sa'jɛ/, ^{b}ⲥⲁⲓⲉ "beautiful" < *sꜥꜣj*.

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[315] Cf. Polotsky (1933: 126) and Osing (1976a: 27f.); more examples can be found in Fecht (1985: 92f.). The alternative explanation by Vycichl (1957b: 13) is less convincing.

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However the localization of the stress position of these adjectives may perhaps be subject to doubt. Sethe (1899-1902: I, § 21) suggests that stress originally fell on the first syllable and later shifted to the final syllable.

5.8.5 Word-final unstressed vowels in Coptic

On non-phonological ⲉ written in the neighborhood of sonorants ☞ also § 5.8.2.

For unstressed vowels in word-final position, there are various distinctions across the dialects which can be combined into four classes of correspondences (see Edel 1961 and Kasser 1989: 130-133). However each single Coptic dialect shows only two or three distinctions, at least in writing; only the obscure so-called "dialect H" has perhaps retained all four distinctions:

	class 1	class 2	class 3	class 4
dialect H[316]	-ⲓ	-ⲓ ~ -ⲏ	-ⲓ ~ -ⲏ ~ -ⲁ	?
papyrus Bodmer 6[317]	-ⲉ	-ⲉ	-ⲁ	-ⲟⲩ
papyrus bilinguis No1 Hamburg[318]	-ⲓ	-ⲓ	-ⲁ	-ⲟⲩ
most Fayyumic texts	-ⲓ	-ⲓ	-ⲉ	-ⲟⲩ
Bohairic	-ⲓ	-ⲓ	-Ø	-ⲟⲩ
some Lycopolitan texts	-ⲓ	-ⲉ	-ⲉ	-ⲟⲩ
some Fayyumic texts[319]	-ⲓ	-ⲓ	-ⲓ	-ⲟⲩ
most varieties of Coptic, among them standard Sahidic as well as Akhmimic	-ⲉ	-ⲉ	-ⲉ	-ⲟⲩ
example from Sahidic	ⲛⲁⲃⲉ /ˈnaβə/ "sin"	ⲣⲱⲙⲉ /ˈromə/ "man"	ⲙⲁⲁϫⲉ /ˈmaːcə/ "ear"	ⲥⲡⲟⲧⲟⲩ /ˈspɔtu/ "lips"

The standard development of Sahidic is -ⲉ, which I interpret as /ə/ as most scholars do. The corresponding vowel of Bohairic is -ⲓ which some scholars (e.g. Loprieno 1995: 48) also transcribe as /ə/. Although it is true that both final vowels are phonologically equivalent, there is nevertheless some evidence that the Bohairic writing is not completely arbitrary and a fronted vowel was indeed articulated:

- Bohairic final -ⲓ triggers ⲓ-epenthesis in words like ϩⲏⲓⲃⲓ (☞ § 3.17.3);
- it can cause vowel dissimilation in Late Coptic (☞ § 5.5.6.2);

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[316] Only attested in the unpublished papyrus Morgan M 636. My data are based on Kasser (1981: 109 and note 25 on p. 106f.).

[317] An archaic text written in a variety close to Akhmimic, published by Kasser (1960).

[318] An archaic text written in a variety close to Fayyumic, published by Diebner & Kasser (1989).

[319] Primarily the so-called "dialect F58", see Diebner & Kasser (1989: 509).

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- word-final unstressed ^{s}ⲉ, ^{b}ⲓ corresponds primarily to -ι or (with case suffix:) -ις in Greek transcriptions of Egyptian words.[320] It is plausible to assume that most Greek transcriptions of Egyptian words are based on a northern dialect, i.e. on a forerunner of Bohairic.

The Coptic vowel class is entirely predictable from the consonants that were formerly adjacent to the vowel. We can generally say that classes 1, 3, and 4 emerged where earlier /j/, /ʕ/, and /w/ respectively appeared in contact. For further details ☞ §§ 5.8.6.4-5.8.6.7. Class 2 is the default development and therefore the most frequent one.

5.8.6 Rules for the loss of Egyptian word-final vowels by the time of Coptic

5.8.6.1 General remarks

The new syllable structure rules predict that every Egyptian word ends in a vowel. The word-final vowel is preserved if it bears stress:

- *r* (ˈra) "mouth" > ^{s,b}ⲣⲟ /ˈrɔ/

If the word-final vowel is unstressed, which is by far the most common case, then it can either be preserved or lost in Coptic. If it is preserved, all differences in quality (or other features) that might have characterized it during more ancient stages of the language are eliminated. In the following chapters, the rules for the loss of word-final vowels are discussed in detail. We can summarize them as follows:

The treatment of the final vowel is largely determined by the consonant which preceded it, i.e. by the last consonant of the Egyptian word. If this consonant was retained, the final vowel was lost. If the last consonant was ‹t›, ‹r›, or ‹ʿ› and it was lost, the final vowel was retained in principle but could secondarily be absorbed if it came into contact with another vowel (i.e. with the stressed vowel, or with a glide which had developed into a vowel). If the last consonant was a glide that was lost, the final vowel was treated as if the glide had not been present, i.e. its development was determined by the consonant before the last of the Egyptian word.

5.8.6.2 Final vowel following a single consonant

If the final vowel is preceded by a single consonant, it is lost without regard to whether the consonant is preserved or not (if the consonant is preserved, this conforms with the basic rule outlined in § 5.8.6.1; if it is lost, the final vowel is absorbed by the stressed vowel):

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[320] Examples are numerous. Note e.g. the name of the goddess Isis (Ισις) < ^{s}ⲏⲥⲉ, ^{b}ⲏⲥⲓ, place names such as Memphis (Μεμφις) < ^{s}ⲙⲛϥⲉ, ^{b}ⲙⲉⲛϥⲓ, or the transcriptions of the month names listed in appendix 6.

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- *p.t* (ˈpVtV) “heaven” > ^{s}ⲡⲉ /ˈpɛ/, ^{b}ⲫⲉ
- *ḥtr* (ḥ[V]ˈtarV) “horse” > ^{s}ϩⲧⲟ /ˈhtɔ/, ^{b}ϩⲑⲟ
- *zp* (ˈzapV) “time” > ^{s,b}ⲥⲟⲡ /ˈsɔp/

5.8.6.3 *Final vowel following a consonant cluster where the last component is preserved in Coptic*

Now let us consider the case that the final vowel is preceded by a consonant cluster. If the second component of the cluster is preserved in Coptic, the final vowel is lost:

- *wdḥ* (ˈwadḥV) “to pour” > ^{s,n}ⲟⲩⲱⲧϩ /ˈwoth/
- *bꜣk* (ˈbaꜣkV) “servant” > ^{b}ⲃⲱⲕ /ˈβok/
- *stp* (ˈsatpV) “to choose” > ^{s,b}ⲥⲱⲧⲡ /ˈsotp/

In the Akhmimic dialect, however, a non-phonemic -ⲉ is written if the second component is a sonorant (☞ 5.8.2):

- *wʿb* (ˈwuʿbV) “priest” > ^{s}ⲟⲩⲏⲏⲃ /ˈweːβ/, ^{b}ⲟⲩⲏⲃ, ^{a}ⲟⲩⲓⲉⲓⲃⲉ /ˈwiːβ[ə]/

5.8.6.4 *Final vowel following a consonant cluster with ‹t› or ‹r› as the last component*

If the second component of a cluster is ‹t› (including ‹t› < ‹ṯ›) or ‹r›, this consonant is lost (☞ § 3.14.3), but the final vowel is usually preserved as ^{s}-ⲉ, ^{b}-ⲓ (vowel of class 2 as defined in § 5.8.5). A possible explanation would be that the second component of the cluster was assimilated to the first component at a stage subsequent to Paleo-Coptic, and the resulting long consonant favored the preservation of the following final vowel:

- *mnʿ.t* (ˈmanVʿtV) “nurse” (>? ˈmanVʿʿV) > ^{s}ⲙⲟⲟⲛⲉ /ˈmɔːnə/, ^{b}ⲙⲟⲛⲓ
- *msḏ.t* (ˈmasVḏtV) “to hate” (>? ˈmasVḏḏV) > ^{s}ⲙⲟⲥⲧⲉ /ˈmɔstə/, ^{b}ⲙⲟⲥϯ
- *mtr.t* (ˈmVtVrtV) “noon” (>? ˈmVtVrrV) > ^{s}ⲙⲉⲉⲣⲉ /ˈmɛːrə/, ^{b}ⲙⲉⲣⲓ
- *nfr.t* (ˈnafVrtV) “good (feminine)” (>? ˈnafVrrV) > ^{s}ⲛⲟϥⲣⲉ /ˈnɔfrə/, ^{b}ⲛⲟϥⲣⲓ “advantage”
- *zbṯ* (ˈzabṯV) “to laugh” (>? ˈzabbV) > ^{s}ⲥⲱⲃⲉ /ˈsoβə/, ^{b}ⲥⲱⲃⲓ
- *sn.t* (ˈsantV) “sister” (>? ˈsannV) > ^{s}ⲥⲱⲛⲉ /ˈsonə/, ^{b}ⲥⲱⲛⲓ
- *ḏr.t* (ˈḏartV) “hand” (>? ˈḏarrV) > ^{s}ⲧⲱⲣⲉ /ˈtorə/, ^{b}ⲧⲱⲣⲓ
- *nṯr* (ˈnaṯrə) “god” (>? ˈnaṯṯV) > ^{s}ⲛⲟⲩⲧⲉ /ˈnutə/, ^{b}ⲛⲟⲩϯ

If the remaining consonant(s) between the stressed vowel and the final vowel are lost as well, then the final vowel is absorbed by the stressed vowel:

- *ḥbsw.t* (ḥ[V]bˈsawtV) “clothing” > ^{s}ϩⲃⲥⲱ /hβˈso/, ^{b}ϩⲉⲃⲥⲱ (instead of *ϩ[ⲉ]ⲃⲥⲱⲉ)
- *šmi̯.t* (ˈšimVjtV) “to go” > ^{s,b,a}ϣⲉ /ˈʃɛ/

If a glide /w/ is preserved between the stressed vowel and the final vowel, the final vowel is retained as we would expect:

- *ṯbw.t* (ˈṯabVwtV) “sandals” > ^{s,a}ⲧⲟⲟⲩⲉ /ˈtɔːwə/, ^{b}ⲑⲱⲟⲩⲓ
- *mꜣwṯ* (ˈmiꜣVwṯV) “to think” > ^{s,a}ⲙⲉⲉⲩⲉ /ˈmɛːwə/, ^{b}ⲙⲉⲩⲓ

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However if another consonant is preserved between the stressed vowel and the glide, then the glide may be secondarily vocalized and may thus absorb the final vowel; the individual dialects behave differently in this respect:

- *mtw.t* (ˈmVtVwtV) "poison" > ^{s}ⲙⲁⲧⲟⲩ /ˈmatu/ (rarely ^{s}ⲙⲁⲧⲟⲩⲉ), ^{a}ⲙⲉⲧⲟⲩ; but ^{b}ⲙⲁⲑⲟⲩⲓ /ˈmatwi/, ^{f}ⲙⲉⲧⲃⲓ
- *rsw.t* (ˈrVsVwtV) "dream" > ^{s}ⲣⲁⲥⲟⲩ /ˈrasu/, ^{a}ⲣⲉⲥⲟⲩ; but ^{b}ⲣⲁⲥⲟⲩⲓ /ˈraswi/, ^{l}ⲣⲉⲥⲟⲩⲉ /ˈrɛswə/, ^{f}ⲗⲉⲥⲃⲓ.

If a glide /j/ was formerly present in a comparable position, there are also different developments across the dialects. In Akhmimic, the glide is preserved and the final vowel is consequently retained: -/jə/. In Bohairic, we would expect that these words end in /-ji/ (glide + final vowel of class 2), but only a single -ⲓ is written which cannot be easily interpreted phonologically. In Sahidic, the glide is lost and the final vowel is therefore absorbed:

- *mrj̣.t* (ˈmirVjtV) "to love" > ^{a}ⲙⲉⲓⲉ /ˈmɛjə/ (or /ˈmɛːjə/?), ^{b}ⲙⲉⲓ /ˈmɛj/ or /ˈmɛi/ (for */ˈmɛji/), ^{s}ⲙⲉ /ˈmɛ/
- *hꜣj̣.t* (ˈhiꜣVjtV) "to fall" > ^{a}ϩⲉⲉⲓⲉ /ˈhɛːjə/, ^{b}ϩⲉⲓ /ˈhɛj/ or /ˈhɛi/ (for */ˈhɛji/), ^{s}ϩⲉ /ˈhɛ/
- *r-prj.t* "temple" > ^{a}ⲣⲡⲉⲉⲓⲉ /ṛˈpɛːjə/, ^{b}ⲉⲣⲫⲉⲓ /ərˈpʰɛj/ or /ərˈpʰɛi/ (for */ərˈpʰɛji/), ^{s}ⲣⲡⲉ /ṛˈpɛ/
- *qꜣy.t* "field" > ^{a,l}ⲕⲁⲓⲉ /ˈkajə/, ^{b}ⲕⲟⲓ /ˈkɔj/ or /ˈkɔi/ (for */ˈkɔji/) (the Sahidic form ⲕⲁⲓⲉ~ⲕⲟⲓⲉ is irregular and was probably borrowed from Akhmimic, ☞ 5.3.1)

‹ʿ› which intervenes between the stressed vowel and the final vowel is lost in Coptic, and thus the final vowel can be absorbed by the stressed vowel as we expect. This regularly happens in standard Sahidic. However the final vowel can also be retained because ‹ʿ› was lost at a comparatively late time (☞ § 3.6.3). This is regular in the dialects other than Sahidic:

- *jʿ.t* (ˈjaʿtV) "to wash" (?> ˈjaʿʿV) > ^{s}ⲉⲓⲱ /ˈjo/; but ^{l}ⲓⲱⲉ /ˈjoə/, ^{b}ⲓⲱⲓ /ˈjoi/
- *mꜣʿ.t* (ˈmuꜣVʿtV) "truth" > ^{s}ⲙⲉ /ˈmɛ/; but ^{a}ⲙⲏⲉ /ˈmeə/, ^{b}ⲙⲏⲓ /ˈmei/[321].

5.8.6.5 *Final vowel following a consonant cluster with ‹ʿ› as the last component*

If the final vowel is preceded by a cluster with ‹ʿ› as the last component, it is usually preserved as ^{s,a}-ⲉ, ^{b}-Ø (vowel class 3 as defined in § 5.8.5):

- *ḏbʿ* (ˈḏubʿV) "finger" > ^{s,f}ⲧⲏⲏⲃⲉ /ˈteːβə/, ^{a}ϯⲉⲓⲃⲉ, ^{b}ⲧⲏⲃ /ˈteβ/
- *msḏr* (ˈmasVḏrV) "ear" > *msḏʿ* (☞ § 3.6.4.4) > ^{s}ⲙⲁⲁϫⲉ, ^{b}ⲙⲁϣϫ
- *mšʿ* (ˈmušʿV) "crowd" > ^{s}ⲙⲏⲏϣⲉ, ^{a}ⲙⲓⲉⲓϣⲉ, ^{b}ⲙⲏϣ

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[321] This is the reading suggested by comparison to Akhmimic, although the Bohairic writing alone would equally allow for a monosyllabic interpretation /ˈmej/ (cf. Osing 1976a: note 102 on p. 439f. and Loprieno 1994: 129).

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However if all consonants between the stressed vowel and the final vowel disappear, the stressed vowel may absorb the final vowel:

- *smꜣꜥ* (s[V]'maꜣꜥV) "to put in order" > ^{s,b,a}ⲥⲙⲟⲩ /'smu/, but ^{m}ⲥⲙⲟⲩⲉ /'smuə/ "to bless"

5.8.6.6 *Final vowel following a consonant cluster with a glide as the last component*

The loss of glides seems to have taken place comparatively early. For this reason, a glide is completely irrelevant for the development of the final vowel if it is the second component of the cluster. If the glide follows ‹ꜥ›, the fact that the final vowel is treated as if the glide were not present is particularly evident since we have the striking correspondence ^{s}-ⲉ, ^{b}-Ø in this case (☞ § 5.8.6.5):

- *šmꜥ.w* "to be fine (stative)" ('šamVꜥwV) (> 'šamꜥV) > ^{s}ϣⲟⲟⲙⲉ /'ʃɔ:mə/, ^{b}ϣⲟⲙ /'ʃɔm/
- *qꜣꜥw* "what is spit out" ('qaꜣVꜥwV) (> 'qaꜣꜥV) > ^{b}ⲕⲁ-ⲕⲟⲓ ~ ⲕⲁ-ⲕⲱⲓ /ka-'kɔj/ "mucus of nose" (WESTENDORF 1965/77: 507; not attested in the other dialects)

The final vowel can, of course, be absorbed if all consonants between the stressed vowel and the final vowel disappear:

- *šꜥj* ('šaꜥjV) "sand" > ^{s,b}ϣⲱ /'ʃo/

If the glide follows a consonant other than ‹ꜥ› (or a glide), this consonant is regularly preserved. Therefore the final vowel is always lost in agreement with the rules given in §§ 5.8.6.2 and 5.8.6.3.

– ‹ꜣ› as the last consonant:

- *bꜣbꜣ* (b[V]'ꜣubꜣV) "hole" (> b[V]'ꜣubV) > ^{s,b}ⲃⲏⲃ /'βeβ/
- *pḫꜣ* ('paḫꜣV) "to break" (> 'paḫV) > ^{s}ⲡⲱϩ /'poh/, ^{b}ⲫⲱϧ
- *mkḥꜣ* ('mVkVḥꜣV) "back of the head" (> 'mVkḥV) > ^{s}ⲙⲁⲕϩ /'makh/
- *qmꜣ* ('qimꜣV) "to throw" > ^{s,b}ⲕⲓⲙ /'kim/ "to move"

– ‹j› as the last consonant:

- *ỉr.t-ỉ* ('jirVtjV) "my eye" > ^{s}ⲉⲓⲁⲧ /'jat/, ^{b}ⲓⲁⲧ
- *ḥꜣ.tỉ* (ḥ[V]'ꜣutjV) "heart" > ^{s,b}ϩⲏⲧ /'het/
- *ḥms.tỉ* (ḥ[V]'mVsVtjV) "to sit (stative)" > ^{a}ϩⲙⲁⲥⲧ~ϩⲙⲉⲥⲧ
- *ḏỉ.t-sbꜣ.tỉ* (... sV'baꜣVtjV) > (Middle Egyptian writing:) *ḏỉ.t-sbꜣ.tw* "to cause to be learned" > ^{a}ⲧⲥⲉⲃⲁⲉⲓⲧ /tsə'βajt/ (reinterpreted as stative)[322]

– ‹w› as the last consonant:

- *pnw* ('pinwV) "mouse" > ^{s}ⲡⲓⲛ /'pin/, ^{b}ⲫⲓⲛ
- *šmw* ('šamwV) "summer" > ^{s,b}ϣⲱⲙ /'ʃom/
- *ḫnzw* ('ḫanVzwV) "Khons (god)" > ^{s,b}ⲡⲁ-ϣⲟⲛⲥ /pa'ʃɔns/ (month name)

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[322] On the etymology of stative forms of causative verbs in Coptic see ELANSKAYA (1981: 107-112).

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5.8.6.7 *Final vowel following a cluster of two glides*

If the final vowel follows a cluster of two glides, it is generally lost as should be expected from the rules given in § 5.8.6.6:

- *djw* ('dijwV) "five" > ^{s}ϯⲟⲩ /'tiw/, ^{b}ⲧⲓⲟⲩ

However complications can arise from the fact that glides may be vocalized secondarily if a preceding consonant is preserved in Coptic. In this case, /w/ is vocalized as ⲟⲩ /u/:

- *pḥ.wi* "end" > ^{s}ⲡⲁϩⲟⲩ /'pahu/, ^{b}ⲫⲁϩⲟⲩ

On the other hand, /j/ is not simply vocalized as ⲉⲓ. Rather, a vowel ^{s}-ⲉ, ^{l}-ⲉ~ⲓ appears (vowel of class 1 as defined in § 5.8.5) which looks exactly like a preserved word-final vowel -ⲉ in most varieties of Coptic. However this is not the successor of the original final vowel but it is a vocalized /j/:

- *ṯzi̯.w* ('ṯazVjwV) "to be supreme (stative)" > ^{s}ϫⲟⲥⲉ /'cɔsə/, ^{l}ϫⲁⲥⲉ~ϫⲁⲥⲓ /'casi/
- *mḥʿw* ('maḥVʿwV) "flax" > *mḥjw* (☞ § 3.6.4.1) > ^{s}ⲙⲁϩⲉ /'mahə/ (not attested in Lycopolitan)

5.8.6.8 *Irregular developments*

There are several instances in which a word-final vowel appears to have been preserved in Coptic when following ‹j› or ‹ꜣ›. I assume that all of these cases should be explained by analogy.[323] Some examples:

- *ḏbꜣ* "to repay" > ^{s}ⲧⲱⲱⲃⲉ /'to:βə/, ^{b}ⲧⲱⲃ~ⲧⲱⲡ; this verb was perhaps influenced by *ḏbʿ* "to seal" > ^{s}ⲧⲱⲱⲃⲉ, ^{b}ⲧⲱⲃ~ⲧⲱⲡ.
- *sṯꜣ* "to draw" developed into both ⲥⲱⲧ /'sot/ and ⲥⲱⲧⲉ /'sotə/. In some dialects a semantic difference between both forms has evolved (e.g. ⲥⲱⲧ "to tear; to do again" vs. ⲥⲱⲧⲉ "to rescue" in Sahidic). I assume that the form ⲥⲱⲧⲉ is irregular and was modelled on verbs of the type *ḫpr* "to become" > ^{s}ϣⲱⲡⲉ /'ʃopə/.
- The dual suffix of nouns of feminine gender, Egyptian *-tï*, should have developed into -ⲧ. This form of the suffix is actually attested in *š(n).tï* "200" > ^{s,b}ϣⲏⲧ /'ʃet/, in the Greek transcription ψχεντ (Fournet 1989: 72) of *pꜣ-sḫm.tï* "the Double-Crown", and in the Old Coptic transcription ⲙⲏⲛⲧ (Osing 1998: I, 109) of *mn.tï* "the two mountains". In all other cases, feminine dual nouns were expanded either by the feminine gender marker *-t* > ^{s}-ⲉ, ^{b}-ⲓ (e.g. *sn.tï* "two [fem.]" + *-t* > ^{s}ⲥⲛⲧ-ⲉ /'sn̩tə/, ^{b}ⲥⲛⲟⲩϯ /'snuti/) or by the plural marker *-w* > ^{s,b}-ⲟⲩ (e.g. *sp.tï* "lips" + *-w* > ^{s}ⲥⲡⲟⲧ-ⲟⲩ /'spɔtu/, ^{b}ⲥⲫⲟⲧ-ⲟⲩ).

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[323] Vycichl (1964) tries to find a phonetic rule for the loss vs. retention of the vowel if the last consonant in a word is *j*. Based on comparative Afroasiatic evidence, he suggests that it is the quality of the posttonic vowel which matters. However, Vycichl's examination is based on the traditional syllable structure rules which implies that he has in mind a posttonic vowel directly preceding *-j*. This cannot be accepted within our framework.

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- In Coptic, the infinitive of some verbs is augmented by a suffix -ⲧⲉ (e.g. *mḥ* "to seize" > ^{s}ⲁⲙⲁϩ-ⲧⲉ /a'mahtə/ (beside ^{s}ⲁⲙⲁϩⲉ; Bohairic has ⲁⲙⲁϩⲓ), *wḏꜣ* "to prosper" > ^{a}ⲟⲩϫⲉⲓ-ⲧⲉ /u'cɛjtə/; Sahidic and Bohairic have ⲟⲩϫⲁⲓ). This suffix has been explained etymologically in various ways: as an agglutinated object pronoun 2nd pers. sg. *-ṯw* "you" by Till (1926: 125f.) (accepted by Fecht 1960: § 253 and by myself in Peust 1995: 72), as an adverb *dï* "here" by Sethe (1929: 68). The suffix has also been identified with a verbal suffix *-tï*, sporadically attested already in Middle Egyptian, with still unknown function (Osing 1976a: 333-338; accepted by Vycichl 1983: 152 and Winand 1992: 96-98). Given the rules outlined above, none of these solutions are satisfactory since all of these elements should have developed into -ⲧ rather than -ⲧⲉ. I consider it probable that -ⲉ was secondarily added to the element -ⲧ (of whatever origin) in order to distinguish these infinitives from the numerous Coptic stative formations ending in -ⲧ. Till's (1928: 56) proposal that -ⲧⲉ can be traced back to the pronominal suffix 2nd pers. pl. *-tn* is likewise problematic because this suffix is otherwise attested as ^{s}-ⲧⲛ, ^{a}-ⲧⲛⲉ in Coptic.

5.8.7 Word-final vowels in Late Egyptian

In the cuneiform transcriptions of the New Kingdom, several words still show final vowels which are lost on the way to Coptic:

- *mḏw* "ten", cuneiform *mu-ṭu* (☞ appendix 3) > ^{s,b}ⲙⲏⲧ /'met/
- *nꜣ-msḥ.w* "the crocodiles", cuneiform *nim-ša-ḫu* (Lambdin 1953c) > ^{s}ⲛⲉ-ⲙⲥⲟⲟϩ /nəm'sɔːh/
- *ḫr* "Syrian", cuneiform *ḫu-ra* ~ *ḫu-ri* ~ *ḫu-ru* (Albright 1946a: 18) > ^{s}ϩⲁⲗ /'hal/ "servant"

but cf.: *ptḥ* (divine name), transcribed in the proper name (*mar-ni-i*)*p-taḫ* (Edel 1994a: II, 363) > ^{s}ⲡⲧⲁϩ /'ptah/

In the representation of such final vowels in cuneiform, a fluctuation of all available vowel graphemes *a*, *u*, *i*, and *e* can be found. In addition to the example *ḫr* just cited, consider the noun *pḏ.tï* "bowman" (not preserved in Coptic), for which the transcriptions *pi-ṭa-ti-ú*, *pi-ṭa-ti*, and *pi-ṭa-tu*$_4$ are found within a single text, to be accompanied by writings such as *pí-ta-ta* and *pí-ta-te* in other texts (Zeidler 1995: 199 and 206). This probably indicates a reduced vowel like [ə]. On the other hand, words with final *-t* in Egyptian, which have preserved the final vowel until Coptic, seem to consistently have final *-a* in the cuneiform documents of the 2nd millennium (see further Fecht 1960: 216-221 and Zeidler 1995: 197-199 on this topic). A problem is posed by the possibility that Akkadian case suffixes, which likewise consist of word-final vowels, might have been added to cuneiform transcriptions of Egyptian nouns at least in some cases.[324]

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[324] Hess (1991) argues that a limited number of the Amarna letters employ Akkadian case marking with non-Semitic names. The evidence he adduces does not seem completely cogent to me.

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5.9 Glides: Vowels or consonants?

5.9.1 Principal pieces of evidence

Coptic has practically no graphical means of distinguishing glides (/j/, /w/) from the corresponding vowel phonemes (/i/, /u/) (☞ § 2.7.4). So there has always been some disagreement about where to draw the line between glides and vowels in Coptic. Any attempted solution must take into account several pieces of evidence which do not always point in the same direction. Depending on how much weight is given to the single pieces of evidence, different conclusions will need to be drawn about the phonological status of glides in Coptic. The most important pieces of available evidence can be summarized as follows:

Etymological evidence:

- Unless (ⲉ)ⲓ or (ⲟ)ⲩ are stressed vowels, they always correspond to consonantal phonemes of Egyptian (an exception being word-final -ⲓ in Bohairic). Unstressed Egyptian /i/ or /u/ have not survived as such in Coptic.
- ⲟⲩ < *w* may operate like a vowel in that it absorbs the original final vowel of a word (☞ § 5.8.6.4). The status of ⲟⲩ varies across the dialects: *rsw.t* "dream" > ^{s}ⲣⲁⲥⲟⲩ /'rasu/ (vocalic ⲟⲩ, otherwise we would have expected *ⲣⲁⲥⲟⲩⲉ) but ^{b}ⲣⲁⲥⲟⲩⲓ /'raswi/ (consonantal ⲟⲩ, therefore -ⲓ is retained).

Morphological evidence:

- Coptic is an inflecting language. Nouns and verbs are arranged into several inflectional classes according to the number of their consonants and the superimposed vowel pattern. Coptic morphology is most easily described if (ⲉ)ⲓ < *j* and (ⲟ)ⲩ < *w* are generally regarded as consonants. For instance, the verb ^{s,b}ⲟⲩϫⲁⲓ (infinitive) – ^{s,b}ⲟⲩⲟϫ (stative) < *wḏꜣ* "to be safe" belongs to the class CCⲁⲓ – CⲟC (just as ^{b}ϧⲑⲁⲓ – ^{b}ϧⲟⲧ "to become fat").
- The Sahidic dialect possesses an allomorph of the definite article ⲡⲉ-, ⲧⲉ-, ⲛⲉ- (as opposed to more common ⲡ-, ⲧ-, ⲛ-) for use before consonant clusters. With words like ⲟⲩϫⲁⲓ "safety" both varieties are attested: ⲡ-ⲟⲩϫⲁⲓ [p-u'caj] ~ ⲡⲉ-ⲩϫⲁⲓ [pə-w'caj].[325] According to Depuydt (1993: 375) there are individual lexical preferences in this respect, so some nouns with ⲟⲩ- prefer the short form and others prefer the long form of the article. This might point to a phonological opposition between glides and high vowels in word-initial preconsonantal position, but further investigations are necessary here.

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[325] The frequently adduced (e.g. by Till 1955: § 88) examples ^{s}ⲧⲉ-ⲩϣⲏ "the night" and ^{s}ⲧⲉ-ⲩⲛⲟⲩ "the hour" do not belong here since in Sahidic the extended form of the article (with -ⲉ) is obligatory with expressions of time in any case (cf. Depuydt 1993: 369-375).

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- According to a rule found by Shisha-Halevy (1977), the status pronominalis of the verb ⲧⲱⲟⲩⲛ /'town/ "to arise" has two allomorphs in Bohairic, namely ⲧⲱⲟⲩⲛ- before the suffixes -ⲓ (2nd pers. sg. fem.) and -ⲟⲩ (3rd pers. pl.), and ⲧⲱⲛ- before all the other suffixes (-ⲧ, -ⲕ, -ϥ, -ⲥ, -ⲧⲉⲛ). The common trait of the suffixes -ⲓ and -ⲟⲩ is probably their vocalic character.

Graphical evidence:

- The Coptic alphabet has virtually no specific means of expressing glides.
- In Bohairic, stops are written with aspirate signs before sonorants and with non-aspirate signs before unstressed vowels (☞ § 3.3.2). Where ⲓ and ⲟⲩ have developed from Egyptian consonants, they are still treated as such wherever a vowel is in contact with them (^{b}ⲑⲟⲩⲱⲧ /'t[^{h}]wot/ "statue" < *twtw* written with the aspirate ⲑ), but they are treated as vowels elsewhere (^{b}ⲥⲫⲟⲧⲟⲩ /'sp^{h}ɔtu/ "lips" < *sp.t-wï*, ^{b}ⲧⲟⲩϫⲟ /tu'cɔ/ "to preserve" < *ḏi̯.t-wḏꜣ* written with the non-aspirate ⲧ).
- In Akhmimic, word-final sonorants are expanded by -ⲉ after consonants (☞ § 5.8.2). This is not true for (ⲉ)ⲓ and (ⲟ)ⲩ which indicates that they were considered vowels in this environment: ^{a}ⲥⲡⲁⲧⲟⲩ /'spatu/ (instead of *ⲥⲡⲁⲧⲟⲩⲉ) "lips" < *sp.t-wï*.

Direct phonetic evidence:

- In Late Coptic pronunciation traditions, (ⲉ)ⲓ < *j* and (ⲟ)ⲩ < *w* are frequently realized as vowels.

5.9.2 Scholarly opinions

The following opinions have been expressed on the topic:

- The opinion that Coptic has no glides at all, thus (ⲉ)ⲓ and (ⲟ)ⲩ always express syllabic vowels, is rarely encountered. This hypothesis may have been intended by Rahlfs (1901: 17), however his statement is not quite clear.
- A common opinion is that (ⲉ)ⲓ and (ⲟ)ⲩ can be vowels as well as consonants, and that original Egyptian consonants may have developed into Coptic vowels where the syllable structure suggests this (Steindorff 1951: 33f.; Vergote 1973/83: Ib, § 41; Ernštedt 1986: 61 and 68-72).
- Another common opinion is that (ⲉ)ⲓ and (ⲟ)ⲩ are phonologically consonants wherever they were such in Egyptian, i.e. in most positions where they do not bear word stress, which does not exclude the possibility that phonological /j/ and /w/ may at times be phonetically realized as vowels (Hintze 1980: 39; Quecke 1984b: note 1 on p. 290; Loprieno 1995: 50).
- Kasser (1982a) introduces a more complex point of view. He argues that Coptic had two coexisting layers of phonological representation, namely one layer for speech with normal rapidity ("tachysyllabation") and another for artificially slow speech ("bradysyllabation"), the latter being the layer which formed the input for writing. Kasser assumes that Coptic did have glides in "tachysyllabation", but all these

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glides were realized as syllabic vowels in "bradysyllabation", this being the reason that Coptic never developed distinct graphemes for rendering glides. Kasser's solution has the disadvantage that operating with two parallel phonological layers for the same language greatly complicates the description of both synchronic and diachronic phonological processes.

- Depuydt (1993: 353f.) argues that although (ⲉ)ⲓ and (ⲟ)ⲩ may have both vocalic and consonantal function to us (i.e. they can form the apex of a syllable or not), the distinction between vowels and consonants as such is inadequate for analyzing the Coptic language.

I will not attempt to make a decision on the issue in this book. A thorough treatment of this problem would need to carefully take into account dialectal and diachronic variation within Coptic.

5.9.3 The borderline between glides and vowels in Pre-Coptic times

In a few cases it is obvious that a glide was reinterpreted as an unstressed vowel or vice versa in Pre-Coptic times:

- *wdḥ* "fruit" developed into ^{s,b}ⲟⲩⲧⲁϩ. However the Akhmimic dialect form of this word is ⲉⲧⲁϩ with irregular loss of *w*. It appears that a form /'wdVḥ/ was reinterpreted as /u'dVḥ/ and the unstressed vowel *u* subsequently developed into *ə* according to the rules given in § 5.8.3 (explanation by Vycichl 1990: 171).
- From the noun *ḥꜣ.t* ('ḥuꜣtV) > ϩⲏ /'he/ "front" there is an adjectival derivation *ḥꜣ.tï* "first". The latter is frequently written with *-w-* from the New Kingdom on and appears as ^{s}ϩⲟⲩⲉⲓⲧ /'hwit/ in Coptic. Assuming that we have an original (ḥu'ꜣitjV), after the loss of ‹ꜣ› in the early New Kingdom (☞ § 3.14.2.1) a form (ḥu'itj[V]) resulted which could easily be reinterpreted as ('ḥwitj[V]) (a similar explanation already by Fecht 1960: 168).
- A comparable phenomenon seems to have occurred in the name of the god Osiris (Coptic ⲟⲩⲥⲓⲣⲉ). The pretonic ⲟⲩ points to an initial consonant ‹w› of the Egyptian predecessor, which is indeed attested in writing during Ptolemaic times. On the other hand, the more ancient writings of this name, although phonetically hard to interpret, can probably only be read with initial ‹ꜣ› (see Osing 1974 for detailed discussion). If we assume that the pretonic vowel was /u/[326], we can reconstruct the Egyptian form as (ꜣu'surV) (or similarly) which after the loss of ‹ꜣ› may have been reinterpreted as ('wsurV).

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[326] So does Osing (1974: 111f.), assuming an etymological connection with the name of the goddess Isis (‹ꜣs.t›, ⲏⲥⲉ) which is to be reconstructed as ('ꜣustV). Such an etymological connection is indeed appealing since both gods are closely connected to each other both in Egyptian mythology and in the writing of their names.

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5.10 Syllabic sonorants

5.10.1 General remarks

The following sections are devoted to syllabic sonorants in Coptic. It appears that sonorants (ⲙ, ⲛ, ⲗ, ⲣ, ⲃ) can generally form the nucleus of a syllable in the Sahidic and Akhmimic dialects. In some cases syllabic sonorants must be assigned a phonological status, but it is possible to analyse most syllabic sonorants as resulting from secondary contractions in a phonological analysis.

At least as far as is evident from the writing, Bohairic seems to have had only syllabic ⲙ and ⲛ, and only under very restricted circumstances. However there is some evidence that syllabic sonorants appeared to a higher extent at a stage prior to historical Bohairic. A comparable disappearance of syllabic sonorants can be observed in late stages of Sahidic.

The Egyptian writing system makes it very difficult to evaluate the degree to which there were syllabic sonorants already in Pre-Coptic stages of the language. I will largely ignore this question here.

5.10.2 Stressed syllabic sonorants before consonants and in word-final position

In cases where a stressed vowel i_{low} (and possibly u_{low}) should be assumed to precede a sonorant – this is ⲃ, ⲗ, ⲙ, ⲛ, or ⲣ (on ⲉⲓ, ⲟⲩ see below) –, the vowel is frequently absorbed and only leaves a syllabic sonorant in Coptic. Vowel absorption is regular in Akhmimic and in Classical Sahidic. This explains why the vowel $^{\text{s}}$ⲁ = $^{\text{a}}$ⲉ, which is the regular outcome of i_{low} (and possibly of u_{low}), is uncommon in this environment.[327]

There are no syllabic sonorants in Bohairic, but sequences of ⲉ + sonorant are found instead; such writings are also frequently encountered in late Sahidic texts. The situation is similar in Fayyumic where ⲉ, ⲏ, or ⲩ + sonorant is written. Since the regular development of i_{low} is $^{\text{s,b}}$ⲁ, it is probable that ⲉ, ⲏ, and ⲩ are secondary developments out of an earlier syllabic sonorant rather than direct reflexes of i_{low}. This implies that there were syllabic sonorants in the unattested forerunners of Bohairic and Fayyumic, or else that the attested writings were mere writing conventions for rendering spoken syllabic sonorants in these dialects.

Consider the following examples:

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[327] ⲁ can precede sonorants in Greek words and in similar late borrowings. ⲁ can also be found in native words where ⲛ is of secondary origin, such as $^{\text{s}}$ϣⲁⲛⲧ- "nose" (status pronominalis) < *šr.t*.

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	Egyptian etymon	gloss	Classical Sahidic	Akhmimic	Bohairic	Fayyumic
ⲃ	*tbt*	fish	ⲦⲂⲦ	ⲦⲂⲦ	ⲦⲈⲂⲦ	ⲦⲨⲂⲦ, ⲦⲎⲂⲈⲦ
ⲙ	*ḫmḏ*	vinegar	ϨⲘϪ	ϨⲘϪ	ϨⲈⲘϪ	ϨⲎⲘϪ, ϨⲈⲘϪ, ϨⲘϪ
ⲛ	*fnṯ.w*	worms	ϤⲚⲦ	ϤⲚⲦ	ϤⲈⲚⲦ	ⲂⲎⲚⲦ, ⲂⲈⲚⲦ
ⲗ	*šlḥ*	branch	ϢⲖϨ	ϢⲖϨ	ϬⲖⲈϨ (sic!)	–
ⲣ	*wrt*	rose	ⲞⲨⲢⲦ	–	ⲞⲨⲈⲢⲦ	ⲞⲨⲎⲖⲦ, ⲞⲨⲈⲢⲦ

The complementary relationship of syllabic sonorants on the one hand and sequences of ^{s,b}Ⲁ + obstruent on the other is clearly evident from Coptic verbal morphology (see Satzinger 1979: 344 and 360f.). For example, the verb ^{s}ⲘⲒⲤⲈ /ˈmisə/ "to give birth" forms a status pronominalis ^{s}ⲘⲀⲤⲦ- /ˈmast-/, whereas the verb ^{s}ϬⲒⲚⲈ /ˈkʲinə/ "to find" forms a status pronominalis ^{s}ϬⲚⲦ- /ˈkʲn̩t-/ (instead of *^{s}ϬⲀⲚⲦ-).

There is usually no absorption of the stressed vowel if the sonorant is word-final. Thus we have

- *rn* (ˈrinV) "name" > ^{s,b}ⲢⲀⲚ /ˈran/, ^{a}ⲢⲈⲚ /ˈrɛn/, ^{f}ⲖⲈⲚ /ˈlɛn/
- *jn* "not" > ^{s,b}ⲀⲚ, ^{a,f}ⲈⲚ
- *b3* "eyeball" (OK, rare) > Demotic *bl* > ^{s,b}ⲂⲀⲖ, ^{a,f}ⲂⲈⲖ "eye" (Wilson 1997: 321f.)

However rare alternative writings with vowel absorption do occur:

- ^{s,a}ⲔⲖ (besides more common ^{s}ⲔⲖⲖⲈ) "bolt" < *q3r.t*
- ^{s}ϬⲖ (besides ^{s}ϬⲀⲖ) "shield" < *qrʿ*

The glides ⲈⲒ /j/ and ⲞⲨ /w/ are in principle also sonorants, but it is not quite clear how i_{low} developed when preceding them. For some reason or another, words are very scarce in which i_{low} (or u_{low}) can be verified to have preceded a preconsonantal glide:

- *ḫ3bs* "shadow" > ^{s}ϨⲀⲈⲒⲂⲈⲤ /ˈhajβəs/
- *zwnw* > *zjnw* "physician" > ^{s}ⲤⲀⲈⲒⲚ /ˈsajn/

☞ also § 5.5.8.

It is evident that i_{low} regularly developed into ^{s,b}Ⲁ before word-final glides:

- *n-j* (ˈnijV) "to me" > ^{s}ⲚⲀⲒ /ˈnaj/
- *n-w* (ˈniwV) "to them" > ^{s}ⲚⲀⲨ /ˈnaw/
- *sk3* (s[V]ˈki3V) "to plough" > ^{s}ⲤⲔⲀⲒ /ˈskaj/, ^{b}ⲤⲬⲀⲒ

However ^{s}ⲞⲨ "what?", a word of unknown etymology, seems to be a syllabic variety of *w* rather than an original vowel /u/ < a_{high}, cf. the writing variety ⲈⲨ (especially common in Lycopolitan) and Polotsky (1957a: note 3 on page 348).

5.10.3 Stressed syllabic sonorants before vowels

Vowel absorption takes place basically according to the same rules before vowels as it does before consonants. However the sonorant graph is written double before vowels,

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probably in order to unambiguously indicate the syllabic nature of the sonorant.[328] For example the Sahidic predecessor of *qni̯.t* ('qinVjtV) "to be fat" is written ^{s}ⲕⲛⲛⲉ, which is probably to be interpreted as /'kn̩ə/. Instead, a writing *ⲕⲛⲉ would suggest a pronunciation /'knɛ/. Bohairic has ^{b}ⲕⲉⲛⲓ which may have been pronounced ['kəni] or ['kɛni] but has probably been derived from earlier */'kn̩i/. In Akhmimic, an additional consonant /j/ is preserved in this word which makes doubling of the sonorant letter unneccessary: ^{a}ⲕⲛⲉⲓⲉ /'kn̩jə/. Consider the following examples:

	Egyptian etymon	gloss	Classical Sahidic	Akhmimic	Bohairic	Fayyumic
ⲃ	*sb.t*	to circumcize	ⲥⲃⲃⲉ	ⲥⲃⲃⲉ	ⲥⲉⲃⲓ	ⲥⲏⲃⲃⲓ
ⲙ	*smi*	to accuse	ⲥⲙⲙⲉ	ⲥⲙⲙⲉ	ⲥⲉⲙⲓ	ⲥⲏⲙⲙⲓ
ⲛ	*qni̯.t*	to be fat	ⲕⲛⲛⲉ	ⲕⲛⲉⲓⲉ, ⲕⲛⲛⲓⲉ	ⲕⲉⲛⲓ	ⲕⲏⲛⲛⲓ
ⲗ	*qꜣr.t*	door-bolt	ⲕⲗⲗⲉ	–	ⲕⲉⲗⲓ	ⲕⲏⲗⲗⲓ, ⲕȣ̄ⲗⲓ
ⲣ	*brj*	to be new	ⲃⲣⲣⲉ	ⲃⲣⲣⲉ	ⲃⲉⲣⲓ	ⲃⲉⲣⲓ

5.10.4 Unstressed syllabic sonorants before consonants and in word-final position

Syllabic sonorants can also occur in unstressed syllables but their status is quite different here. They are mere positional variants of sonorants and not related to an original i_{low}.

It may be assumed that sonorants were generally pronounced syllabically when not adjacent to a vowel. While verbs like ^{s}ϣⲗⲁϩ /'ʃlah/ "to be afraid" and ^{s}ⲥⲱⲧⲡ /'sotp/ "to choose" were probably pronounced as monosyllabics (☞ § 2.7.5), Sahidic verbs such as ^{s}ⲙⲕⲁϩ "to be sad" and ^{s}ⲥⲱⲧⲙ "to listen", which belong to the same morphological classes as the above-mentioned verbs, may have been pronounced as disyllabics: /m̩'kah/, /'sotm̩/, although this is by no means certain.

Sahidic has two forms of the definite article, a long form (ⲡⲉ-) which appears before consonant clusters, and a short form (ⲡ-) which appears elsewhere. With nouns such as ⲣⲡⲉ "temple", both forms are attested: ^{s}ⲡⲉ-ⲣⲡⲉ ~ ^{s}ⲡ-ⲣⲡⲉ,[329] so no easy decision is possible as to whether the initial sonorant was perceived as a consonant or as a vowel.

Unstressed syllabic sonorants also occur in Bohairic and Fayyumic where stressed syllabic sonorants are unknown (or at least concealed on the graphic surface). However in Bohairic (I leave aside Fayyumic here), only ⲙ and ⲛ can be written syllabically, which, furthermore, is only encountered in word-initial position. In all other cases, the

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[328] Thus Sethe (1918). Hodge (1981) gives a different interpretation assuming that the written sequence of two sonorants is a device for rendering a sequence /ʔ/ + sonorant in the spoken language.

[329] Depuydt (1993: 350, 367f.). Depuydt states that "ⲡⲉⲣⲡⲉ is standard in good manuscripts" (p. 367).

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sonorant is preceded by ⲉ in writing. Cf. ^{s}ⲛⲧⲟⲕ — ^{b}ⲛⲑⲟⲕ "you" but ^{s}ⲣⲡⲉ — ^{b}ⲉⲣⲫⲉⲓ "temple". ^{s}ⲥⲱⲧⲙ "to hear" corresponds to ^{b}ⲥⲱⲧⲉⲙ, and while ⲙⲕⲁϩ "to be sad; sadness" has the same form in Bohairic, the combination with the definite article ⲡ- is written ^{b}ⲡ-ⲉⲙⲕⲁϩ instead of *ⲡ-ⲙⲕⲁϩ.[33a]

In any case, the syllabic pronunciation of sonorants in this position, if at all existent, would probably be an automatic phenomenon and would not be of phonological relevance. On the vocalization of *w* and *j* in comparable environments ☞ §§ 5.8.6.4-5.8.6.7 and 5.9.3.

5.10.5 Unstressed syllabic sonorants before vowels

Unstressed syllabic sonorants also occur before vowels; these are usually stressed vowels. Their etymological background is obscure. As before unstressed vowels, these syllabic sonorants are written double. This is true even in Bohairic and Fayyumic where an additional epenthetic vowel can appear.

	Egyptian etymon	gloss	Classical Sahidic	Akhmimic	Bohairic	Fayyumic
ⲃ	*ḏi̯.t-wꜥb*	to purify	ⲧⲃⲃⲟ	ⲧⲃⲃⲟⲟⲩ	ⲧⲟⲩⲃⲟ	ⲧⲉⲃ(ⲃ)ⲁ, ⲧⲉⲃ(ⲃ)ⲟ
ⲙ	*m-im-*	in (status pronominalis)	ⲙⲙⲟ- (old also ⲛⲙⲟ-)	ⲙⲙⲁ-, ⲛⲙⲁ-	ⲙⲙⲟ-, ⲛⲙⲟ-	(ⲙ)ⲙⲁ-
ⲛ	?	to pound	ⲧⲛⲛⲟ	ⲧⲛⲛⲟ	ⲧⲉⲛⲛⲟ	ⲧⲉⲛⲛⲁ
ⲗ	*ḫl-ꜥꜣ*	old man	ϩⲗⲗⲟ	ⳉⲗⲗⲟ	ϧⲉⲗⲗⲟ	ϩⲉⲗ(ⲗ)ⲁ, ϩⲗ(ⲗ)ⲁ
ⲣ	*(p)r-ꜥꜣ*	king	ⲣⲣⲟ	ⲣⲣⲟ	ⲟⲩⲣⲟ	ⲣⲣⲁ, ⲉⲣ(ⲣ)ⲁ, ⲓⲣⲣⲁ

In rarer cases unstressed syllabic sonorants may also have preceded unstressed vowels. For example, the combination of the preposition ⲛ and the (unstressed) indefinite article ⲟⲩ is written ⲛⲛⲟⲩ- in certain texts (see e.g. Kahle 1954: I, 119f.) but ⲛⲟⲩ- in others. ⲛⲛⲟⲩ- seems to be a rendering of /n̩u-/ which contrasts with the possessive article ^{b}ⲛⲟⲩ- /nu-/ "their" (☞ also § 6.4.7.2).

5.10.6 Syllabic sonorants and vowel length

There is no evidence for long syllabic sonorants in Coptic. If i_{low} or u_{low} were lengthened, they were not usually absorbed by a following sonorant but they were preserved:

- *br* "(kind of a boat)" > ^{s}ⲃⲁⲁⲣⲉ /ˈβaːrə/, borrowed into Greek as βᾶρις whence English "bark"

[33a] See Depuydt (1993: 368). The segmentation can only be ⲡ-ⲉⲙⲕⲁϩ because Bohairic has no long form ⲡⲉ- of the definite article. As was stated above, Sahidic also frequently has a form ⲡⲉⲙⲕⲁϩ which looks the same but must be explained by a different rule.

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- *rri.t* ('rVrVjtV) “sow” > ^{s}ⲣⲁⲁⲣⲉ /'raːrə/
- *šrj.t* “daughter” > ^{s}ϣⲉⲉⲣⲉ /'ʃɛːrə/, ^{b}ϣⲉⲣⲓ
- *ḏꜥn.t* “Tanis (town)”, perhaps to be reconstructed as ('d̮uꜥVntV) (cf. Vycichl 1983: 328) > ^{s}ϫⲁⲁⲛⲉ /'caːnə/

However, there are a few examples for which I would expect that vowel lengthening took place according to the rules given in § 5.5.10.2. Nevertheless the vowel was absorbed by the sonorant. There is the possibility that these words had long syllabic sonorants which however are not clearly rendered as such in writing:

- *qꜣr.t* ('qVꜣVrtV) “door-bolt” > ^{s,a}ⲕⲗⲗⲉ /k'l̩ə/ (/k'l̩ːə/ ??)
- *qrꜥ* “shield” > ^{s}ϭⲗ~ϭⲁⲗ

5.10.7 The phonological status of syllabic sonorants in Coptic

In Sahidic and Akhmimic, syllabic sonorants occur in any environment in which vowels are allowed. However they seem to be phonemic only when unstressed and immediately preceding a vowel at the same time. In this case, minimal pairs can be found such as the following from Sahidic:

- ⲣⲟ /'rɔ/ “mouth” – ⲣⲣⲟ /r̩'ɔ/ “king” – ⲉⲣⲟ /ə'rɔ/ “to you (fem.)”
- ⲧⲛⲟⲙ /'tnɔm/ (besides ⲧⲗⲟⲙ) “furrow” – ⲧⲛⲛⲟ /tn̩'ɔ/ “to pound” – ⲧⲉⲛⲟⲩ /tə'nu/ “now” – ⲧⲁⲛⲟ /ta'nɔ/ “to produce”

If certain marginal exceptions, especially loan words, are disregarded, stressed syllabic sonorants are in complementary distribution with the vowel ^{s,b}ⲁ = ^{a,f}ⲉ. Although a writing such as ⲕⲛⲛⲉ is rendered as /'kn̩ə/ in this book, which is probably closer to its actual pronunciation, the same word can also be represented as /'kanə/ on a more abstract level of phonological representation.

5.10.8 Emergence and loss of syllabic sonorants

Most syllabic sonorants can be avoided in a phonological analysis (☞ above), and stressed syllabic sonorants are in complementary distribution with the vowel ^{s,b}ⲁ = ^{a,f}ⲉ (< Egyptian i_{low}, u_{low}). This fact is traditionally regarded as an indication that they are an innovation within the Egyptian language. It is, however, difficult to say at which time syllabic consonants emerged.

The much discussed (e.g. Schenkel 1986, Schneider 1993) term *nzw* “king” with somewhat uncertain reading is attested both as *un-zu* / *un-šu* and as *in-si* in cuneiform attestations from the time of the New Kingdom. The varying transcription *un* ~ *in* is perhaps to be interpreted as the rendering of a syllabic nasal. In Coptic, *nzw* is still preserved in the compound ^{s,a}ϣⲛⲥ /'ʃn̩s/, ^{b}ϣⲉⲛⲥ “fine linen” < *šs-nzw* “royal linen” which indeed has a syllabic nasal. On this question cf. further Zeidler (1995: 225-228).

It is also possible that the phenomenon known as defective writing (☞ § 2.6.4) is related to a syllabic pronunciation of consonants to a certain extent.

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In certain late Sahidic texts there is a tendency to eliminate syllabic sonorants.[331] I assume that this is a language change favored by the increasing influence of Bohairic and/ or Arabic which lack such sounds. The former syllabic sonorants are frequently written with a preceding vowel letter (most often Ⲉ), which leads to the same state that is already known in Bohairic. Furthermore, preconsonantal syllabic Ⲛ can be replaced by Ⲉ, e.g. Ⲛ- (genitive marker) > Ⲉ-, ⲘⲚ- "with" > ⲘⲈ-. We can compare this to the elimination of the syllabic *ṛ* from Sanskrit which was generally replaced by short vowels (*a*, *i*, *u*) in Middle Indic, e.g. Sanskrit *nṛtyam* "dance" > Pali *naccaṃ* > Hindi *nāc* "dance". However there is the possibility that the vowel Ⲉ < Ⲛ was still nasalized (☞ § 5.7.3). Vocalization of sonorants other than Ⲛ is not attested.[332]

Where Sahidic has syllabic sonorants, we usually find *ο* or *ε* preceding (or replacing) the sonorant in Greek transcriptions of Egyptian words (see Lacau 1970e and Vycichl 1990: 205f.). The word *nzw* "king", for which the late pronunciation is to be reconstructed as /ˈn̩s(V)/, is preserved in three different forms in Greek renderings of the late proper name *pꜣ-i.ḏi̯-jmn- n z w -tꜣ.wï*: *πατεμσ̲τους*, *πατεμε̲σ̲τους*, *πατεμο̲σ̲τους* (Lüddeckens & Thissen 1980ff.: I, 284). Vycichl (1990: 205f.) assumes that the ε-forms are modelled on the Bohairic dialect and only the o-forms reflect true syllabic sonorants.

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[331] Green (1983: 67, 71), Kahle (1954, I: 93, 97, 113-117, 121f., 125f., 159f., 166, 180).

[332] However the prefix of the negative perfect (^{S}ⲘⲠⲈ-) is found as ⲈⲠⲈ- (Kahle 1954: I, 159). Since the phonological distinction between syllabic Ⲙ and syllabic Ⲛ is neutralized before labials, ⲘⲠⲈ could in theory be interpreted as /n̩pə-/.

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6 Prosody

6.1 Word stress

6.1.1 Stress and tone from a typological perspective

Let us now turn to features such as word stress and tone, which can be subsumed under the term accentuation. We can understand accentuation as marking phonemic segments of various length, in the simplest case syllables or moræ. Markedness is meant to be an abstract concept which may have various phonetic realizations: The marked element may be spoken with a higher pitch than the rest of the word, with a lower pitch, with an increased air flow, with a longer duration, etc. There are at least three parameters along which different languages can vary with respect to accentuation:

1) Distribution

A language is a stress language in the strict sense of the term if exactly one element (syllable, mora) in a word is marked. However there are languages in which the distribution of stressed and unstressed syllables is handled more freely. In Japanese, for example, there is a binary distinction between stressed and unstressed moræ, but in addition to words where exactly one mora is marked (stressed), there are also independent words in which all moræ are phonologically unmarked (cf. Tsujimura 1996: 74-78). On the other hand, numerous languages of the world allow for marking of more than one (although not necessarily for any) syllable or mora in a word. In this case, the language is commonly called a tonal language. There need not be much acoustic difference between a stress language and a tonal language; the crucial issue is to what degree the accentuation of individual syllables or moræ in a word is independent from one another.

2) Number of stress distinctions

In most stress languages, word stress involves a binary distinction: A syllable (or mora) is either stressed (marked) or unstressed (unmarked). But it is also possible for a language to have three or more distinctions. In Swedish and in Serbian/ Croatian, for example, there is a ternary distinction, since in these languages a syllable can be unstressed (unmarked), stressed with high pitch, or stressed with low pitch. A similar phenomenon seems to have existed in Ancient Greek. But these are still stress languages since only one syllable in a word is stressed (either high or low) whereas all other syllables are unstressed. Tonal languages frequently also have a binary contrast, most typically a contrast between high and low pitch. However the number of distinctions can be higher and in fact reaches four contrastive tones in Standard Chinese and up to eight in the Cantonese dialect of Chinese.

3) Predictability

In stress languages, word stress may be predictable from the phonetic form of the word (bound accent) or not (free accent). Stress may be predictable by a straightfor-

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ward rule (in many languages the first or the last syllable of a word is stressed throughout), but also by more complex rules such as in Latin or in Cairene Arabic (on stress in Cairene Arabic cf. Halle & Vergnaud 1987: 60-63). In some languages, among them English, stress is not predictable and is therefore phonologically distinctive. Tones in tonal languages are generally phonologically distinctive.

Whereas stress languages are predominant in modern Europe, probably most modern languages of the world are tonal languages. Very diverse accentuation types are attested within the Afroasiatic stock. Most modern Arabic dialects of the Near East have a bound word accent. The same is habitually assumed for Classical Arabic.[333] Cairene Arabic also has a bound word accent, although the rules for its placement are very complex. Stress seems to be phonologically distinctive in most African dialects of Arabic, including certain varieties of Egyptian Arabic, as well as in the Berber languages (cf. Durand 1995, Khalafallah 1969: 17). It is difficult to discuss the issue of word accent in extinct Semitic languages such as Akkadian or Biblical Hebrew. In Modern Hebrew, at least, word accent is distinctive (/bi'ra/ "capital city" — /'bira/ "beer", cf. Podolsky 1991). In Gəʿəz (Old Ethiopic) stress does not seem to have been predictable either, at least as far as can be concluded from the traditional pronunciation of Gəʿəz recorded by Trumpp (1874). Chadic languages are typically tonal languages, usually having a binary or ternary pitch opposition. The same is true for the (non-Afroasiatic) Nubian languages which are spoken to the immediate south of Egypt. Most Cushitic languages seem to be tonal as well, but it is not always permissable for all syllables in a word to be tonally marked independently from the others. So it is possible at least in some cases to reduce the tonal features present in surface phonology to an underlying stress system in deep phonology (Rendille as analysed by Pillinger 1988).

6.1.2 Stress in Coptic: internal evidence

It is evident from what has been said above that genetic or areal considerations do not permit a conclusion as to which kind of accentuation Egyptian or Coptic might have had. Fortunately, internal evidence of Coptic clearly indicates that exactly one syllable in a word is marked. To date, all scholars have interpreted this marked syllable as the stressed syllable (cf. e.g. the reasoning by Magnus 1969: 12), which I believe is correct.

- The short vowels Ⲏ, Ⲟ, and Ⲱ can occur at most once in a word, i.e. in the marked syllable. This is to say that the vowel inventory is larger in marked syllables than in unmarked syllables. (This does not hold true for borrowings from Greek.)
- Long (i.e. double) vowels only appear in the marked syllable (☞ §§ 5.2.3.2, 5.3.3).
- In Bohairic, aspirate and non-aspirate stops (Ⲑ vs. Ⲧ etc.) only contrast in the onset of the marked syllable (☞ § 3.3.2). (Again this does not hold true for borrowings from Greek.)

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[333] Actually, there is no reliable information as to how words were stressed in Classical Arabic, cf. Knudsen (1980: 7-10).

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6.1.3 Stress in Coptic: evidence from Late Coptic and borrowings into Arabic

As expected, the syllable which has been described as the marked syllable in § 6.1.2 is usually stressed in the Late Coptic pronunciation as well as in Coptic borrowings into Arabic (for examples ☞ appendices 6, 8, 9). However there is one major exception: Stress is retracted in words which were stressed on a word-final vowel (or occasionally on a word-final diphthong) in Coptic. This rule was first formulated in a paper by Wolfgang Schenkel which is still to appear (Schenkel *in preparation*). The explanation is easy: Stressed word-final vowels do not occur in Egyptian Arabic, so the accent is shifted in order to adapt the Coptic words to the native phonological system. Consider the following examples:

- ^{s}ⲡ-ⲣⲡⲉ /pr̥ˈpɛ/, ^{b}ⲡⲓ-ⲉⲣⲫⲉⲓ "temple" > /ˈbirba/ "ancient temple"[334]
- ^{s}ⲡⲉ-ⲥϩⲟ /pəsˈhɔ/, ^{b}ⲡⲓ-ⲥϧⲟ /pisˈxɔ/ "plough handle" > /ˈbasxa/ ~ /ˈbaṣxa/ "foot of a plough, to which the plough share is attached"[335]
- ^{s}ϭⲗⲃⲟⲟⲩ /kl̥ˈβɔw/, ^{b}ϫⲉⲗϥⲁⲩ (a fish, *silurus mystus*) > /ˈʃilba/ (idem)[336]
- ^{s,b}ϣⲟⲩⲣⲏ /ʃuˈre/ "censer, thurible" > /ˈʃurja/ (idem)[337]
- Greek μονή "place to stay" > ^{s,b}ⲙⲟⲛⲏ > /ˈmunja/ *et var.* (a frequent place name in Egypt, here belonging also /ʔil-ˈminja/, a major town in Middle Egypt)[338].

Stress can even fall on an originally prosthetic vowel as in the names of two well-known Upper Egyptian towns:

- *zny.t* > ⲥⲛⲏ /ˈsne/ (> */əsˈne/) > /ˈʔisna/ اسنا
- *ḏbꜣw* > ⲧⲃⲱ /ˈtβo/ (late also ⲁⲧⲃⲱ, Timm 1984-1992: III, 1151, which may represent something like /ətˈβo/) > /ˈʔidfu/ ادفو

6.1.4 Stress marks in Coptic manuscripts

Word stress was not regularly indicated in most Ancient Greek texts, but some literary manuscripts did employ accentuation marks. Since the Coptic script is derived from the Greek, it might be expected that such accentuation marks can also be found in Coptic. This is indeed true, though only for a few texts:

- Two Sahidic manuscripts (Crum 1915: XII and 122; Winstedt 1910: 169-211) use accentuation marks, but only for a minor proportion of the Greek loan words and generally not for native Coptic words. The stress position usually falls where we

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[334] Hinds & Badawi (1986: 60), Vittmann (1991: 207). ʔIl-Birba البربا also appears as a toponym in Egypt, see Timm (1984-1992: vol. 4, p. 1900).

[335] Hinds & Badawi (1986: 74, 79), Vittmann (1991: 206).

[336] Hinds & Badawi (1986: 475), Vittmann (1991: 214).

[337] Hinds & Badawi (1986: 463), Vittmann (1991: 215).

[338] Vycichl (1983: 116), Timm (1984-1992: vol. 4, pp. 1650-1670).

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would expect it from Greek. However, whereas Ancient Greek has two phonologically contrastive stress types which are distinguished by three accent marks (acute ´ and grave ` as allographs on the one hand, circumflex ^ on the other), both Coptic texts confuse this distinction. The manuscript edited by Crum does not employ the circumflex mark at all, and the manuscript edited by Winstedt uses all three accent marks indiscriminately. This seems to indicate that the pitch distinction of Ancient Greek was unfamiliar to the Copts.

- The Greek – Old Coptic bilingual Paris Magical Papyrus (= pBibl. Nat. suppl. gr. 574)[339], to be dated from the 4th century AD, employs two Greek diacritics within the Coptic passages, namely the spiritus asper (ʽ) to mark the phoneme /h/ and the acute accent (´) to mark word stress. Curiously, no accent marks are used in the Greek passages of the same manuscript.[340]

  We find that the acute accent usually falls on syllables we expect to be stressed,[341] but by far not all stressed syllables are supplied with this diacritic. I suggest that phrase accent might have played an additional role. Consider the following passage (line 112f., text and translation based on Satzinger 1994b: 215):

  ⲉⲛⲁ́ⲓ ⲛ̄ⲙⲟϥ ⲉⲏ́ⲧ ⲥⲱ́ⲡ ⲛ̄ⲙⲟϥ ⲉ̔ⲛ ⲡⲉⲥⲛⲟ́ⲃ ⲛⲟⲩⲥⲓ́ⲣⲉ ⲙⲉⲓ́ϥ ⲧⲉⲛⲥⲉ́ⲙⲉ'
  bring it before-me dip it in the-blood of-Osiris give-it that-we-appeal
  "Bring it before me. Dip it in the blood of Osiris. Hand it over, and we will appeal (magically)."

  The object pronoun ⲛ̄ⲙⲟϥ "it" certainly had an own word stress as is evidenced by its o-vowel. However it lacks an accent mark in both occurrences here. It is possible that, although the pronoun was stressed, its accent was little prominent relative to the whole phrase. Further research on this text would appear promising.

- Till (1931b, cf. especially p. 4f.) has edited a manuscript written in the Akhmimic dialect which uses the acute accent (´) as a stress marker. This marker always falls where we expect word stress, but it is applied to only 25 different words altogether, which is a small percentage of the total number of words in this text. Most of the marked stressed syllables either contain a long vowel (i.e. a vowel written double) or a diphthong. There is also a single example of an accentuated Greek loan word: [ⲡⲉ]ⲧ̄ⲣ̄ⲙⲉ́ⲗⲉⲓ "he who cares" (from μέλειν "to care") (Till 1931b: 26, line 21).

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[339] The latest edition of the Coptic passages is by Satzinger (1994b).

[340] As can be judged from two sample photographs of the text in Deissmann (1923: 218f.). The standard text edition (Preisendanz 1973: I, 64-180) is misleading in this point since diacritics are added by the editor, as is common in classical philology.

[341] Marked mostly on the nucleus but sometimes on the offglide and once (ⲧⲟⲩ́ⲏⲓ̈, line 151) on the onset. Some words have more than one accent mark (ⲟⲩ́ⲁ́ⲕ line 114, ⲓⲟ́ⲡ́ⲓ line 114, ⲧϭⲁ́ⲛⲓ́ⲛⲓ line 118), sometimes the accent is left of what we would expect ([ⲉ?]ⲧ́ϭⲟⲩ line 97, ⲡⲁ́ⲃⲉⲗϥ line 108, ⲉⲗ́ⲱⲃ line 115), which is perhaps a mere graphical inaccuracy.

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- A Sahidic manuscript edited by **Budge** (1898) marks word-final stressed vowels by a diacritic (ˆ), although not consistently. Budge does not comment on this feature of the text. An examination of the long and well-preserved manuscript would appear promising.

6.1.5 How to determine the stress position in a Coptic word

It is possible to determine the stress position for almost all native Coptic words especially from the internal evidence discussed in § 6.1.2. Sometimes data from more than one Coptic dialect must be taken into consideration. For instance, both dialectal varieties ^{s}ⲁϩⲉ (/'ahə/?, /a'hɛ/?) and ^{b}ⲁϩⲓ (/'ahi/?, /a'hi/?) "age" would be ambiguous with respect to the stress position if considered on their own. However the correspondence ^{s}-ⲉ – ^{b}-ⲓ indicates a word-final unstressed vowel (☞ § 5.8.5), so both dialectal varieties together tell us that stress was on the first syllable of this word. Etymological criteria can also be helpful. Sahidic ⲟⲩⲛⲟⲩ "hour", for example, seems to be ambiguous at first (/'unu/?, /u'nu/?). However its Egyptian etymon *wnw.t* "hour" clarifies that this word must be read /u'nu/ since stressed *u* can only develop where two consonants originally followed it within the word (☞ § 4.2, cf. also § 5.5.7). Further examples of such reasonings can be found in **Till** (1948-49: 13-18). It is a necessary implication of this kind of argumentation that the stress position was not subject to diatopic or diachronic variation in Egypto-Coptic, at least in the stages from Paleo-Coptic onward. With a few exceptions (☞ § 5.8.4), this premise has always been accepted by Egyptologists, and no major contradictions have been encountered.

The accentuation of Greek loan words in Coptic poses more problems since the internal criteria available for native words cannot be applied for them (☞ § 6.1.2). We know particularly little about the accentuation of Greek verbs in Coptic. Within Greek, the stress position of virtually all verbs was variable throughout the paradigm, but when Greek verbs were borrowed into Coptic they were used in a single invariable form which has no exact equivalent in Greek.[342]

6.1.6 Phonemic stress in Coptic?

Coptic words are always stressed on one of the last two syllables. Since Coptic word stress is intermingled with vowel quality and quantity to a high degree, it depends a lot on the interpretation of the vowel system whether stress in Coptic is to be considered bound or free. Cf. the following possible (near-)minimal pairs from Sahidic:

- ⲁϩⲉ /'ahə/ "age" (^{b}ⲁϩⲓ) — ⲉϩⲉ ~ ⲁϩⲉ /ə'hɛ/ or /a'hɛ/ "yes" (^{f}ⲁϩⲏ)
- ⲟⲩⲗⲁⲉ /'wḷə/ "music" (cf. ^{f}ⲟⲩⲉⲗⲓ) — ⲃⲗⲗⲉ /βḷ'ɛ/ "blind" (^{b}ⲃⲉⲗⲗⲉ, ^{f}ⲃⲉⲗⲗⲏ).

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[342] On the accentuation of Greek verbs in Coptic cf. **Till** (1948-49: 18-20). **Böhlig** (1995) believes that the Coptic forms of Greek verbs are based on Greek infinitives.

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As long as the unstressed -Є is transcribed as /ə/ as it is here and everywhere in this book, these are not minimal pairs. In theory, we could propose an alternative analysis according to which ə is an allophone of the phoneme /ɛ/. In the latter analysis, it would become possible to consider word stress as phonologically distinctive.

Similar methodological problems are encountered in other languages. In German, for example, "aktiv" /ak'ti:f/ "active" vs. "Aktiv" /'akti:f/ "active voice (grammatical category)" may be considered a minimal pair distinguished by the position of stress. However /i:/ is spoken somewhat shorter in /'akti:f/ than in /ak'ti:f/, and if we decide to analyse this quantitative difference as phonemic, this would allow for the conclusion that word accent is not distinctive but predictable in German.

While most scholars do not address the issue of the phonological status of Coptic word accent at all, Knudsen (1962: 197) decides to analyze it as non-phonemic.

6.1.7 Stress in Pre-Coptic Egyptian

Word stress is not indicated in the indigenous Egyptian scripts. Our opinions about stress in Egyptian are therefore based largely on speculation. It is generally assumed that the stress position in a word as evidenced from Coptic was the same in the earlier language (at least as far back as the Paleo-Coptic stage). In the conventional Paleo-Coptic reconstruction stress is therefore assumed to have fallen on one of the last two syllables in a word. In the revised Paleo-Coptic reconstruction as proposed in this book, it must be assumed that stress either falls on the penult or on the antepenult syllable of a word.

If we believe that the reduced vowels as known in Coptic unstressed syllables already existed in Egyptian, stress would not be phonemic here either (thus Knudsen 1962: 199). On the other hand, most modern scholars assume that the Paleo-Coptic vowel inventory was similar or identical in stressed and unstressed syllables (☞ § 5.8.1). If this is true, we can conclude that stress was phonemic in Egyptian.

A few scholars who adopt the latter point of view try to reconstruct an even earlier stage of Egyptian in which stress was again predictable. Based on certain Egypto-Semitic etymologies, Sethe (1923: 205f.) and Vycichl (1983: x and 1990: vi, 174f., but 215) assume that Paleo-Coptic stress at least partly reflects a Pre-Paleo-Coptic distinction of vowel quantity (☞ also § 5.5.7). Similarly, Callender (1987: 33-37) believes that the fourth mora[343] counted from the end of a word was originally invariably stressed. In order to explain Coptic words with final stress such as ⲂⲈⲔⲈ /bə'kɛ/ "wages", he suggests the assumption that either the stressed syllable originally had four moræ (*baȝké::w*, Callender 1987: 35) or that stress is the result of analogy here (Callender 1987: 36). These accounts are very speculative in nature.

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[343] In his words the third mora, but this is obviously a miscounting.

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A few scholars have expressed the idea that earlier or prehistoric Egyptian might have been a tone language.[344] There is however no concrete evidence for this.

6.2 Compounds

6.2.1 Coptic compounds with final stress

Let us define a word in Coptic as a unit that has a single word stress. Coptic words in this sense are often composed of several elements which seem to have been individual words in the earlier language and frequently still survive as independent words in Coptic. Such complex words can be called compounds. In a Coptic compound, only one of the original components is stressed, most frequently the last one. The phonetic shape of the stressed component of a compound is usually identical to the shape of the same element as an independent word (this is not true if the stressed component is not final, ☞ § 6.2.2). On the other hand, the unstressed elements have undergone heavy phonetic reduction as is typical for Egyptian non-stressed syllables in general. If they are at all still analyzable as individual morphemes in Coptic, they have developed into proclitic prefixes. Many different syntagms, ranging from short phrases to complex sentences, have thus developed into compounds on the way to Coptic. It is possible that the position of word accent in these compounds reflects the position of a phrase or sentence accent of the earlier language.

Compounds in this sense cannot be recognized in Pre-Coptic Egyptian since the stress position is not obvious from the script here (but ☞ § 6.3 for syntactic evidence in Earlier Egyptian).

We have examples for the developments of Coptic compounds from the following syntactic constructions:

Noun + dependent genitive (so-called "direct genitive" construction)

- *hrw* "day" (> ^{s}ϩⲟⲟⲩ /'hɔːw/) + *ms.t* "to give birth" (> ^{s}ⲙⲓⲥⲉ /'misə/) > ^{s}ϩⲟⲩ-ⲙⲓⲥⲉ /hu'misə/ "birthday"
- *md.t* "word, matter" (> ^{s}ⲙⲟⲩⲧⲉ /'mutə/) + *rmṯ* "man" (> ^{s}ⲣⲱⲙⲉ /'romə/) > ^{s}ⲙⲛⲧ-ⲣⲱⲙⲉ /m̩[n]t'romə/ "humanity"

This way, many former nouns have developed into nominal prefixes in Coptic. However this process is no longer productive, i.e. not all Coptic nouns have a proclitic form.

Noun + attributive marker + dependent genitive (so-called "indirect genitive" construction)

- *ꜣ* "great" (> Old Coptic ⲟ /'ɔ/) + *n* (attributive marker) + *mḏw* "10" > ^{s}ⲁ-ⲛ-ⲙⲏⲧ /an'met/ "chief of 10 men"

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[344] Czermak (1931/34: 108, 138-140), Vergote (1954a: 79, 1954b: 105, and 1969: 78f.), Vycichl (1956b: 227).

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The indirect genitive construction is still current in Coptic, however the first noun does not normally lose its word stress as it does in this example.

Noun + adjective

- *i͗trw* “river” (> ^{s}ⲉⲓⲟⲟⲣ /'jɔːr/) + *ꜥꜣ* “great” > ^{s}ⲉⲓⲉⲣ-ⲟ /jə'rɔ/ “Nile”
- *rnp.t* “year” (> ^{s}ⲣⲟⲙⲡⲉ /'rɔmpə/) + *nfr.t* ”good” > Old Coptic ⲣⲉⲛⲡ-ⲛⲁⲃⲣⲉ (female proper name, literally “happy year”; Heuser 1929: 17)

This construction, as most of the following constructions, is no longer productive in Coptic.

Noun + attributive clause

- *rmṯ* “man” (> ^{s}ⲣⲱⲙⲉ /'romə/) + *i͗w* (subclause marker) + *f* “he” + *ḏd* “to sing” > ^{s}ⲣ-ⲉ-ϥ-ϫⲱ /rəf'co/ “singer”

Cardinal number + noun

- *fdw* “four” (> ^{s}ϥⲧⲟⲟⲩ /'ftɔw/) + *ṯꜣw* “wind” > ^{s}ϥⲧⲟⲩ-ⲧⲏⲟⲩ /ftu'tew/ “the four wind directions” (Vycichl 1983: 281f.)
- *mḏw* “ten” (> ^{s}ⲙⲏⲧ /'met/) + a derivation from *wꜥw* “one” > ^{s}ⲙⲛⲧ-ⲟⲩⲉ /m[n̩]t'wɛ/ “eleven”

Infinitive + nominal object

- *i͗n.t* “to bring” (> ^{s}ⲉⲓⲛⲉ /'inə/) + *pꜣ-j-šrj* “my son” > ^{s}ⲛ-ⲡⲁϣⲏⲣⲉ /n̩pa'ʃerə/ “to bring my son”

This construction is still very frequent. Most transitive verbs have a proclitic form (“status nominalis”) in Coptic which may be used if a non-pronominal direct object follows.

Auxiliary + main verb

- *rḫ* “to know” (not preserved as a stressed verb in Coptic) + *sḏm* “to hear” > ^{s}ϣ-ⲥⲱⲧⲙ /'ʃotm̩/ “to be able to hear”

Participle + nominal object

- *mri̯* “loving” (not preserved in stressed position in Coptic) + *nṯr* “god” > ^{s}ⲙⲁⲓ-ⲛⲟⲩⲧⲉ /maj'nutə/ “pious”

Infinitive + prepositional phrase

- *ḏd* “to say” (> ^{s}ϫⲱ /'co/) + *r-* “to” > ^{s}ϫⲉ-ⲣⲟ- /cə'rɔ/ “to say to; to mean” (Černý 1971: 45)
- *di̯.t* “to give” (> ^{s}ϯ /'ti/) + *n-j* “to me” > abnormal Sahidic ⲧ-ⲛⲁⲓ /'tnaj/ (Emmel 1981: 132)

Imperative + prepositional phrase

- *mi* (?) “give!” (> ^{b}ⲙⲟⲓ /'mɔj/) + *n-j* “to me” > ⲙⲁ-ⲛⲁⲓ /ma'naj/ (Polotsky 1950: 76-79)

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Phrase

- *ḥrw* “Horus (god)” (> ^{s}ϩⲱⲣ /'hor/) + *wḏꜣ.w* “is healthy (stative)” > ϩⲉⲣ-ⲟⲩⲟϫ /hər'wɔc/ (Αρυωτης in Greek transcription) (male proper name, lit. “Horus is healthy”; Lüddeckens & Thissen 1980ff.: 796-798, Heuser 1929: 19)
- *ꜥnḫ* “live” + *f* “he” + *n* “for” + *ḫnsw* ”Khons (god)” > Χα-π-ο-χωνσις in Greek transcription (= /xafn̩'xɔnsə/ or similarly) (male proper name, lit. “it is for/ through Khons that he lives”; Lüddeckens & Thissen 1980ff.: 100, for the grammatical analysis see Quack 1991: 94f.)
- *ḏd* “say” + *mnṯw* “Month (god)” + *iw* (future marker) + *f* “he” + *ꜥnḫ* “live” > Old Coptic ⲕⲁ-ⲙⲉⲛⲧ-ⲉ-ⲃ-ⲱⲛⲭ (= /camənta'fonx/ or similarly) (male proper name, lit. “Month has said that he will live”; Heuser 1929: 14)

Phonetic reduction of non-stressed elements is far less expressed in cuneiform transcriptions of such compounds from the New Kingdom, however certain traces of reduction already seem to be observable at that time (Zeidler 1995: 215-227).

6.2.2 Compounds with non-final stress

6.2.2.1 Definition

Compounds with final stress as described in § 6.2.1 are the only productive type of compounding in Coptic. However a limited number of compounds can be found in Coptic or in Greek / Old Coptic transcriptions which are stressed at another position, namely

1) on the stressed syllable of the first component, or
2) on a syllable somewhere between the stressed syllables of the first and the last components.

Let us call them type 1 and type 2 compounds as opposed to type 3 compounds which are stressed on the stressed syllable of the final component.

In compounds of types 1 and 2, all components, including the last one, have typically experienced some phonetic modification, so they are no longer analyzable as compounds from a synchronic point of view. It has been suspected early that compounds of these types are particularly ancient formations. Fecht (1960) has devoted a monographical study to them and calls them “Komposita älterer Bildungsweise” or simply “ältere Komposita”.

However we cannot conclude from this that compounds of type 3 were exclusively formed at a later date. Some compounds of this type are likely to be very old, such as the divine names *nb.t-ḥw.t* > Old Coptic ⲛⲉⲫⲑⲱ, Greek Νεφθυς, “Nephthys”, and *ḥw.t-ḥrw* > ^{s}ϩⲁⲑⲱⲣ, ^{b}ⲁⲑⲱⲣ “Hathor”. Both names are attested as such from the Old Kingdom on (or earlier), and it seems probable that they early conflated into single words. The preservation of the final *-t* of the first components of these names shows with certainty that univerbation took place earlier than the New Kingdom (☞ § 3.14.8). This implies that all three types of compounding were productive side by side during a certain period of the

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Egyptian language. I am unable to define a functional difference between these alternative compound formations. It is possible that still unexplored features of the internal syntactic or semantic structure of the compound played a role. Vycichl (1990: 252) suspects that dialectal divergences were responsible.

Some examples of type 1 / 2 compounds which I consider comparatively certain are cited below. They are arranged by the date at which they are first attested in combination. This does not, of course, imply that the process of compounding actually took place at the indicated time since a) the compound may have been used earlier than its first known occurrence, and b) the fact that the elements occurred in syntagmatic combination does not presuppose that they already formed a compound at the time in question.

6.2.2.2 Examples

compound type	Coptic or Greek transcription	Egyptian	references
ATTESTED FROM THE OLD KINGDOM ON			
1 or 2	γετου[345]	*wꜣḏ-wr* "sea", lit. "(the) large blue"	Fecht (1960: 10-12)
2	^{s}ⲉⲗⲟⲓϩ "shepherd"	*mr-iḥ.w*, lit. "overseer (of) cattle"	Fecht (1960: 38)[346]
1 or 2	^{s}ⲙⲛϥⲉ, ^{b}ⲙⲉⲛϥⲓ "Memphis (city)"	*mn-nfr* (originally name of the pyramid of Pepi I, a king of the late Old Kingdom; later name of the adjacent city of Memphis)	Fecht (1960: 43f.)
2	^{s,b}ⲛⲓⲙ "who?"[347]	*in-m* (focalizing particle + interrogative pronoun)	Fecht (1960: 95)
2	^{s}ⲡⲣⲁⲛϣ "archive", ^{b}-ⲫⲣⲁⲛϣ	*pr-ꜥnḫ*, lit. "house (of) life(?)"	Osing (1976a: note 1122 on p. 836f.)[348]

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[345] Final υ (or ου) reflects /w/ of *wr*, whereas γ reflects /w/ of *wꜣḏ*. We have to read either /ˈwɛtu/ or /wəˈtɔw/ (or similarly).

[346] Vycichl (1983: 42 and 1990: 248) rejects this example, to my mind not convincingly.

[347] The first syllable was lost irregularly in the New Kingdom. The focalizer *in* was reduced to *n* at the same time. This seems to indicate that *in-m* was still morphologically analyzable at that time (which is certainly no longer the case in Coptic).

[348] For Old Kingdom attestations of *pr-ꜥnḫ* and for the general meaning of this term see Gardiner (1938: 160). The Bohairic form only occurs in the compound ^{b}ⲥ-ⲫⲣⲁⲛϣ "dream interpreter" where the etymology of the first element is disputed. There is also doubt about the meaning and the grammatical form of the element *ꜥnḫ*. On these questions see Lucchesi (1975) and Vycichl (1983: 194f.). Osing convincingly argues that the stressed vowel -ⲁ- must be a part of *pr* no matter which form *ꜥnḫ* may be (stressed ^{s,b}ⲁ before ⲛ is impossible morpheme-internally, ☞ § 5.10).

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1 or 2	^{s}ⲥⲓⲧ(ⲉ), ^{b}ⲥⲓϯ "basilisk"	*zꜣ-tꜣ*, lit. "son (of the) earth"	Fecht (1960: 93)
1 or 2	ταυ (name of the 8th Upper Egyptian nome)	*tꜣ-wr(r)*, lit. "great (or: high) land"	Fecht (1960: 12), Edel (1987: 124-128, 133)
2	^{s}ⲧⲱⲣⲧ~ⲧⲱⲣⲧⲣ, ^{b}ⲧⲱⲧⲉⲣ "stair"[349]	*tꜣ-rd*, lit. "ground of foot, footground"	Fecht (1960: 93)
1	^{s,b}ϩⲟⲛⲧ "heathen priest"[350]	*ḥm-nṯr* "priest", lit. "servant (of) god"	Fecht (1960: 42f.)
1 or 2	Old Nubian ⲧⲟϩⲟⲛⲇⲉ ~ ⲧⲟⲛⲇⲉ "altar"[351]	*ḥw.t-nṯr* "temple", lit. "house (of) god)"	Roquet (1972), Browne (1996: 181)
1 or 2	Late Egyptian/ Demotic *snt*[352] "to prostrate oneself"	*sn-tꜣ*, lit. "(to) kiss (the) ground"	Wb IV, 154
1 or 2	^{m}ϯ-ⲛⲓ /ˈtini/ "to give (to) me"[353]	*ḏi̯.t* "to give" + *n-j* "to me"	Schenke (1996: 104)

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[349] ⲧⲱⲣⲧⲣ is a secondary development creating a seemingly reduplicated stem. ^{b}ⲧⲱⲧⲉⲣ probably results from metathesis. The lack of aspiration in Bohairic indicates that the stressed vowel followed *ꜣ* rather than preceding it.

[350] One would expect *^{s}ϩⲟⲛⲧⲉ (☞ § 5.8.6); it is not clear why -ⲉ was lost here.

[351] ⲧⲟϩⲟⲛⲇⲉ is suspicious of being a loan word because ϩ /h/ is not a regular phoneme in Old Nubian (nor is it in its modern successor Nobiin, cf. Werner 1987: 35). This word has been borrowed together with the Egyptian feminine definite article *tꜣ* (Coptic ⲧ-). This compound is not preserved in Coptic (on ^{s}ϩⲉⲛⲉⲉⲧⲉ "monastery" which some scholars connected to *ḥw.t-nṯr* see Vycichl 1983: 306), nor in modern Nubian.
The stressed vowel of *nṯr* "god" (Coptic ^{s}ⲛⲟⲩⲧⲉ) has been elided which probably indicates that this element was unstressed in the Egyptian compound, i.e. main stress must have been on *ḥw.t*. It is unknown in which way the Egypto-Coptic word stress was adopted in Old Nubian which was probably a tonal language; tones are not marked in the Old Nubian script.

[352] Treated as a single verb due to univerbation from the New Kingdom on (Wb IV, 154; see also Erichsen 1954: 435 and Jansen-Winkeln 1996: § 63). This verb is not preserved in Coptic, so its vocalization is not known. It must have been integrated into a class of four- or three-consonantal verbs, depending on whether ‹ꜣ› was still spoken at the time of univerbation or not. Whichever is the case, in all pertaining verbal classes known in Coptic the stressed vowel of the infinitive is somewhere before the third consonant of the word (e.g. ⲥⲱⲥⲥ, ⲥⲟⲥⲥⲉ, ⲥⲥⲓⲥⲉ). For this reason, the compound *sn-tꜣ* was probably stressed on the element *sn*, unless it belonged to a verbal class which is no longer known in Coptic.

[353] A compound of *ḏi̯.t* + pronominal dative with stress on the second component is also attested in certain varieties of Coptic (☞ § 6.2.1). However most Coptic dialects, including standard Sahidic and Bohairic, do not form a compound out of this phrase at all.

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		ATTESTED FROM THE MIDDLE KINGDOM ON	
1 or 2	Old Coptic ⲣⲉⲧ "surviving dependant"	*ḥrï-tꜣ*, lit. "who-is-upon (the) earth"	FECHT (1960: 93)
1	^{s,b}ⲟⲩⲱⲛϩ "to reveal"	*wn-ḥr* "to see, to show", lit. "(to) open (the) face"	Wb I, 312f.
		ATTESTED FROM THE NEW KINGDOM ON	
2	^{s}ⲃⲉⲛⲓⲡⲉ, ^{b}ⲃⲉⲛⲓⲡⲓ "iron"	*biꜣ-n-p.t*, lit. "metal of heaven"	FECHT (1960: 86f.)
1	^{s}ⲕⲟⲓⲁϩⲕ, ^{b}ⲭⲟⲓⲁⲕ[354] (4th month of the Coptic year)	*kꜣ-ḥr-kꜣ* (name of a feast and month name)	FECHT (1960: 95f.)
2	Μνηυις (name of a holy bull)[355]	*mr-wr(r)* (name of a holy bull)	FECHT (1960: 7-10)
1 or 2	^{s}ϭⲣⲟⲟⲙⲡⲉ, ^{b}ϭⲣⲟⲙⲡⲓ "dove"	*gr-n-p.t*	FECHT (1960: 82f.)[356]
		ATTESTED LATER	
2	^{a}ⲉⲧⲛⲓϩ (hapax legomenon) "ashes"	**ïwtn-n-ẖ.t*, lit. "earth of fire" (not attested)	FECHT (1960: 87f.)

Two of these compounds have also been preserved in cuneiform transcriptions from the 2nd millennium BC, namely ^{s}ⲕⲟⲓⲁϩⲕ, ^{b}ⲭⲟⲓⲁⲕ as *ku-i-IḪ-ku*[357] *[ˈkujəḥəku (or similarly)] and ^{s,b}ϩⲟⲛⲧ as *ḫa-am-na-ta* et var. The latter was also borrowed as *anata* "priest" into Meroïtic (HINTZE 1973b: 332).

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354 I assume with VYCICHL (1983: 74) that the Coptic word was stressed on the first syllable, which is evidenced both by the ⲟ-vowel and by the aspirate ⲭ in Bohairic. There is no need to assume that it was stressed on the last syllable (thus OSING 1976a: 348), or that both syllables had equal stress (thus FECHT 1960: §§ 176-178 and p. 223f.).

355 η seems to be the stressed vowel. Μν- is probably a Greek substitution of Egyptian /mr-/, an initial cluster foreign to Greek.

356 VYCICHL (1990: 249) questions this example suspecting that the Egyptian writing *gr-n-p.t*, which distinctly includes the word *p.t* "heaven", is based on folk-etymology. Although this possibility cannot be excluded, I still consider ^{s}ϭⲣⲟⲟⲙⲡⲉ to be a comparatively certain compound until additional negative evidence comes to light. *gr* "bird" is also attested in isolation. This word might be related to the unclear animal term ϭⲣⲉ which is once attested in Sahidic (cf. WESTENDORF 1965/77: 464). ϭⲣⲟⲟⲙⲡⲉ /ˈkʲrɔːmpə/ or a related form may be the etymon of Latin *columba* "dove", as LEFORT (1931: note 2 on p. 120) supposes. The Latin word must be further compared to Old Church Slavonic *golǫbĭ* "dove", Russian голубь "dove", Greek κόλυμβος ~ κολυμβίς ~ κολυμβάς "podiceps minor". These words cannot have been inherited from Proto-Indo-European because the sound correspondences are irregular. Borrowing from Egyptian is therefore a serious possibility, although it has not been considered by Indo-Europeanists.

357 The cuneiform sign *iḫ* can be equally interpreted as *aḫ* or *uḫ*.

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6.2.2.3 *The development of compounds with non-final stress: previous interpretations*

It is evident that all compounds-to-be must have once been syntagms consisting of several independent words. When a compound was formed, stress was fixed on one of its components, and the other components were phonetically reduced. Consider the noun *nṯr* "god" which turns up in Coptic as ^{s}ⲚⲞⲨⲦⲈ /'nutə/, ^{b}ⲚⲞⲨϮ in isolation but as -ⲚⲦ in the compound ϨⲞ-ⲚⲦ /'hɔ-nt/ and as -ⲚⲆⲈ in Nubian ⲦⲞϨⲞ-ⲚⲆⲈ. The noun *tꜣ* "earth" becomes ^{s}ⲦⲞ /'tɔ/, ^{b}ⲐⲞ in isolation but -Ⲧ(Ⲉ) in ⲢⲈ-Ⲧ and ⲤⲒ-Ⲧ(Ⲉ). There have been several attempts to explain this phonetic reduction.

- Sethe simply seems to assume a synchronic compound rule for Earlier Egyptian according to which, after stress had been fixed on the first component, the non-first components were phonetically changed. To Sethe, this is a rule specific to compound forming which is not related to the development of individual words. It is the opposite of the rule for type 3 compounds according to which all non-final components of a compound were phonetically reduced. Cf.:

  > "In all diesen Fällen hat eine Zurückziehung des Tones (...) und eine Neuvokalisierung des Wortes stattgefunden." (Sethe 1910: 25)
  >
  > "Angesichts dieses Befundes wird man sich zu fragen haben, ob nicht für die ältere ägyptische Sprache (...) ein dementsprechendes Betonungs- und Enttonungsgesetz anzunehmen ist, das dem später im Kopt. herrschenden entgegengesetzt war." (Sethe 1923: 192)

- Fecht (1960) proposes a historical explanation to explain the form of type 1 / 2 compounds. By Fecht's time, the opinion had gained ground that unstressed syllables of Egyptian words in general experienced massive phonetic reduction on the way to Coptic (☞ § 5.8.1). So Fecht advances the suggestion that non-stressed components of a compound were treated like non-stressed syllables of a word and the phonetic reductions of both are essentially due to the same phonetic process. If this scenario is accepted, the development of compounds can in turn shed light on the development of single words in Egyptian. Fecht has devoted a whole book (Fecht 1960) to the development of type 1 / 2 compounds and the conclusions he draws from them for the development of Egyptian stress rules and syllable structure in general.

  > "Es muß angenommen werden, daß unser bisher nur bei den «älteren Komposita» festgestelltes Dreisilbengesetz einmal allgemeine Gültigkeit auch außerhalb der Komposita besessen hat. (...) Unterschiede zwischen Komposita und einfachen Wörtern in der Schnelligkeit der Entwicklung sind natürlich möglich (...) – eine primäre, prinzipielle Verschiedenheit in der Betonungsweise ist aber ausgeschlossen; derartiges gibt es in keiner Sprache." (Fecht 1960: § 326)

Since according to Fecht unstressed compound elements are reduced due to regular processes of Egyptian word phonology, the compounds must have been created (e.g.

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the former syntagms must have merged into single words) before their components started to be phonetically reduced.

- Schenkel (1968: 538) seems to propose a contrary scenario according to which compounds were formed after the reduction of the individual components had already taken place:

  > "(...) die «älteren Komposita» wurden erst dann zu Wörtern gestempelt und dabei mit einem Wortakzent versehen, als sie nötigenfalls durch die Lautentwicklung bereits (...) verkürzt waren."

  Schenkel does not further elaborate on his theory. For this reason, it is not quite clear how exactly the reduction of (future) compound elements could have taken place.
- It is also possible to assume that the reductions were not due to a regular phonetic process but rather due to analogical adaptations to existing nominal classes. This scenario is likewise hinted at by Schenkel:

  > "Exzeptionelle Verstümmelungen und selbst Akzentverschiebungen könnten daher kommen, daß das Syntagma in das Wort eines bestimmten Schemas durch Analogiebildung überführt wurde." (Schenkel 1968: 539, similarly Schenkel 1990: 84)

6.2.2.4 *The development of compounds with non-final stress in the light of the revised syllable structure rules*

It seems to me that Fecht's basic idea is correct. Let us consider the development of compounds in English. The Old English word *man* "man" is today pronounced /'mæn/ as an independent word, but the same element *man* has been reduced to -/mən/ in the compound *woman* /'wʊmən/ (Old English *wīf-man*, lit. "wife-man"). The word *day* /'dei/ is usually reduced to something like -/di/ in the names of the days of the week. A single Germanic stem *leika-* is the predecessor of both the English adjective and preposition *like* /'laik/ and the adverbial suffix *-ly* -/li/ of modern English. The divergent development of these elements can be understood by the different rules for the development of stressed vs. unstressed syllables in English words, and we do not need specific "compound development rules" to explain the reduction of, e.g., the element *man* within the compound *woman*. Similar examples of a reduction of non-stressed elements of compounds by the regular rules of phonetic development of words can be found in numerous languages around the world.

Fecht's examination of type 1 / 2 compounds is based on the traditional syllable structure rules. It turns out that these compounds cannot be explained from the conventional Paleo-Coptic reconstruction. Instead, Fecht has to assume that they were formed at an even earlier Pre-Paleo-Coptic stage which he attempts to reconstruct (☞ § 4.5.2). His exposition is quite complex and not free of difficulties and contradictions (cf. Schenkel 1968). If the new syllable structure rules proposed in this book are accepted, Fecht's

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conclusions cannot be maintained and the topic needs a complete reexamination. I cannot present a new theory in detail here, but I will briefly express some reflections on what a revised scenario might look like.

At which time were the type 1 / 2 compounds formed? They could not have been formed as late as Coptic, since on the one hand we would have difficult transformation rules which would remain unexplained (e.g. ^{s}ⲚⲞⲨⲦⲈ "god" > -ⲚⲦ(Ⲉ) in compounds), and on the other hand compound stress would sometimes fall on syllables which have not been preserved elsewhere by Coptic (e.g. ^{s}ⲂⲈ-ⲚⲒ-ⲠⲈ /βəˈnipə/ whereas the genitive marker is simply Ⲛ, not *ⲚⲒ, in Coptic). The cuneiform transcription of *ḥm-nṯr* > ^{s,b}ϨⲞⲚⲦ (☞ § 6.2.2.2) indicates that the phonetic reductions were still absent or had progressed very little in this compound by the time of the New Kingdom. Thus some period of historical Egyptian may well have been the time at which such compounds were formed. For the time being, let us assume that they were formed at the Paleo-Coptic stage.

If compounds are assumed to have been formed at the Paleo-Coptic stage, it will be legitimate to attempt a Paleo-Coptic reconstruction of them. Let us consider one example: *mr-iḥ.w* > ^{s}ⲈⲖⲞⲒϨ requires a Paleo-Coptic reconstruction (m[V]'rajVḥwV). The first element *mr-* no longer exists as a fully stressed word in Coptic, but the second element *iḥ.w* "cows" is still preserved as ^{s}-ⲎϨ (in the toponym ^{s}ⲦⲠⲎϨ, cf. Peust 1995: 74) which requires a Paleo-Coptic reconstruction ('juḥwV). Thus, the compound ⲈⲖⲞⲒϨ < (m[V]'rajVḥwV, more precisely: m[V]'rajuḥwV) can easily be derived by a simple juxtaposition of (m[V]'ra) and (juḥwV) at the Paleo-Coptic stage of Egyptian. As soon as we fix the compound formation at the Paleo-Coptic stage, no specific compound rules are needed but the rules which are valid for the development of words are sufficient to explain the development of ⲈⲖⲞⲒϨ.

Now consider the example ^{s}ⲤⲒⲦ(Ⲉ) < *zꜣ-tꜣ*. Since Ⲓ arises in a closed syllable (☞ § 4.7), the Paleo-Coptic reconstruction should be (z[V]'ꜣitꜣV) or ('ziꜣtVꜣV)[358]. Unfortunately, there is no way of determining whether compound stress fell on the first or on the last syllable of *zꜣ*. Both *zꜣ* "son" and *tꜣ* "land" have to be reconstructed with two open syllables and initial stress in Paleo-Coptic ('CVCV) since this is the only possible reconstruction for words with two consonants (☞ § 4.7). *tꜣ* is preserved as ⲦⲞ in Coptic which allows for the more precise reconstruction ('taꜣV). It becomes evident that a simple juxtaposition of both components (zVꜣV-taꜣV) cannot explain ^{s}ⲤⲒⲦ(Ⲉ). We need an additional elision rule in order to produce a closed syllable in this compound. I am not going to discuss here whether the compound was formed somewhat later than the Paleo-Coptic stage so that, e.g., word-final vowels had already been elided at the time when both elements conflated into one word, or whether the compound was formed at a stage somewhat earlier than Paleo-Coptic so that there was still time for vowel elisions to take place before the

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[358] The type 'CVCCVCV would be somewhat irregular in my reconstruction, but at the present stage of knowledge I cannot decide with certainty whether it was completely impossible or not.

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Paleo-Coptic stage was reached. In any case, a form such as ('ziꜣtaꜣV) or (z[V]'ꜣitꜣV) rather than ('ziꜣVtaꜣV) or (zV'ꜣitaꜣV) must have formed the input for ^{s}ⲤⲒⲦ(Ⲉ). But the difference is not great, and the addition of an elision rule would probably not complicate our picture of Pre-Coptic Egyptian very considerably. It is of course possible that not all type 1 / 2 compounds were formed at the same time.

If the first element of a compound was stressed, it is possible that stress fell on the syllable in which the first element would be stressed in isolation. This is true e.g. for ('ḥamV-naṯrV) > ^{s,b}ϨⲞⲚⲦ and ('kaꜣV-ḥVrV-kaꜣV) > ^{s}ⲔⲞⲒⲀϨⲔ (where ‹ꜣ› is still preserved as -Ⲓ-) (= type 1). In other compounds, however, stress fell somewhere after the syllable which would be the stress position of the first element in isolation (= type 2). This could even be the final syllable of the first component which would not have been preserved if the word had survived in isolation: (m[V]'ra-juḥwV) > ^{s}ⲈⲖⲞⲒϨ, (jV'ni-mV) (> jV'nim ?) > ^{s}ⲚⲒⲘ, and (mV'ru-wVr(r)V) (> mV'ruwrV ?) > Μνηυις. Also ⲁ in ^{s}ⲔⲞⲒⲀϨⲔ can hardly be anything other than a former word-final vowel of *kꜣ* ('kaꜣV). This is a further argument in favor of the new syllable theory admitting word-final vowels which I propose in this book.

6.3 Clitic placement and intonational units in Earlier Egyptian

Egyptian has enclitic elements which are placed at what can be called the second position in a sentence. Such clitics are particularly frequent in Earlier Egyptian and then again in Coptic (especially Sahidic). Describing their position is complicated by the fact that syntactical constituents can occasionally be extraposed to the left of a sentence and do not count then.

Clitic placement in Sahidic Coptic has been discussed in detail by Shisha-Halevy (1986: 164-168). I will only discuss a single clitic of Old/ Middle Egyptian here. This is the element *pw* which is comparatively frequent and occurs in very diverse syntactic environments. On the functions of *pw* see Loprieno (1995: 103-112). The position of *pw* is described by Abel (1910), Edel (1955/64: II, § 960-962), Gardiner (1957: § 129, § 189, § 190), and Westendorf (1962: § 404). We can often observe that *pw* is not placed after the first word in a sentence but rather after more complex sections. These sections cannot be defined in terms of syntactic constituency. It is therefore reasonable to assume that they are motivated on the phonological level, i.e. *pw* is placed after the first intonational unit in a sentence. Abel's (1910: 3) assumption that these intonational units are equivalent to words, i.e. have a single word accent, is probably too extreme.

pw never intervenes in the following syntagms, which therefore form intonational units in this sense:

- noun + demonstrative pronoun *pn* (Abel 1910: 20-22)
- noun + pronominal possessive suffix
- noun (regens) + noun (rectum) ("direct genitive" construction)
- cardinal number + noun (Abel 1910: 24)

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- nouns coordinated without conjunction (Abel 1910: 15f.)
- adjectival predicate + subject (Westendorf 1962: § 404,5)
- negation 𓂜𓈖 + noun or verb (Westendorf 1962: § 348 bb,1 and § 351 e)

pw does not usually intervene in the following syntagms, although there are exceptions:

- verbal predicate + subject noun phrase + direct object noun phrase in VSO clause structures (Westendorf 1962: § 404, 7)
- causative verb *rdi͗* "to make s.one do s.thing" + dependent subjunctive verb (Westendorf 1962: § 404, 8)

The combination noun + adjective/ participle/ relative form is preferably not separated in Old Egyptian whereas *pw* does intervene in Middle Egyptian.

The following syntagms are always split up by *pw*:

- definite article *pꜣ* + *pw* + noun (Westendorf 1962: § 404, 9; Gardiner 1957: § 190)
- noun (regens) + *pw* + genitive marker *n* + noun (rectum) ("indirect genitive" construction)
- noun + *pw* + noun as apposition (Abel 1910: 13)
- noun + *pw* + noun (forming a nominal sentence)
- subject noun + *pw* + verbal predicate (e.g. a stative form) in SV clause structures (Gardiner 1957: § 190; Westendorf 1962: § 405)

These rules also work in combination. For example, when *pw* is added to the syntagm *verbal predicate* + [*subject noun* + *genitive marker* + *rectum noun*], we end up with: *verbal predicate* + *subject noun* + *pw* + *genitive marker* + *rectum noun*.

6.4 Graphical reflexes of boundaries

6.4.1 Introduction

We will probably never know anything about Egyptian intonation itself, but we can get information on boundaries of segments some of which certainly also coincided with intonational units. Syntactic criteria for recognizing possible intonational units were discussed in § 6.3. Let us now consider graphical expressions of boundaries in Egyptian and Coptic. I will proceed from large to small linguistic units without discussing to what extent each of these may have also been reflected on the phonological level. We may assume that the syllable certainly played a role on the phonological level, whereas the morpheme probably did not. Sentences, although primarily a syntactic category, probably also corresponded in some way or another to a specific intonation contour.

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6.4.2 Large units (paragraphs, sentences) in Egyptian

Egyptian texts provide not many superficial indications of boundaries as compared with most scripts of the modern world. Neither words nor sentences are separated by spaces, and interpunctuation hardly exists. However there are some methods used to separate entities approximately of the size of a paragraph or a section in a text, although all of them are applied in a facultative manner:

- The first words of a new paragraph are frequently written in red color (called "rubrum").[359] This possibility is restricted to hieratic texts and is not found in hieroglyphs nor in Demotic.
- At the end of a paragraph, it is possible to leave the rest of the line or column empty in order to begin the new paragraph in a new line or column.
- More rarely, a free space can appear within a line to indicate a new paragraph.[360]

The hieroglyphic group 𓊗𓏭 seems to be the only example of a punctuation mark in the strict sense. This can be an ordinary writing of the Egyptian phrase *zp sn.wï* "two times". In addition, the group is frequently used in a metalinguistic sense to indicate that the preceding word or morpheme must be read twice. From the New Kingdom on and perhaps even earlier, the use of this group is extended further. It is frequently used at the end of a sentence for the purpose of emphasis and is as such more or less equivalent to our exclamation mark.[361] The sign can also be cumulated as 𓊗𓏭𓊗𓏭 or 𓊗𓏭𓊗𓏭𓊗𓏭𓊗𓏭, which corresponds to our '!!' and '!!!!'.

6.4.3 Large units (paragraphs, sentences) in Coptic

Coptic literary texts often employ a so-called paragraph sign for introducing a paragraph. Some Coptic literary texts use specific capital letters for this purpose.

Many Coptic manuscripts employ several diacritics (points and strokes of various forms) some of which also serve to indicate boundaries. There has been little research on Coptic diacritics, and they are often not carefully reproduced in text editions. One of the texts that show a comparatively extensive use of diacritics is the manuscript of the gospel of Luke published by Quecke (1977). Quecke discusses their use on pp. 14-27. He finds that several signs serve to separate units of different extent but all of them are used in a facultative manner. De Bourguet (1985) discusses the use of punctuation signs for separating clauses in another Sahidic manuscript. This text also employs a simple free space for separating clauses.

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[359] On rubra see Posener (1949) who also discusses another, rarer use of rubra involving semantic implications.

[360] On spaces in hieroglyphic and hieratic texts see Rössler-Köhler (1984/85).

[361] This has been discovered independently by Wessetzky (1945) and Schott (1954).

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6.4.4 Intermediate units (phrases, words) in Egyptian

In the Latin script, there are essentially two devices for marking word boundaries. Most important are separation signs (blanks). On the other hand, certain letters are restricted to specific positions in a word (capital letters to word-initial position).

The first device has no equivalent in Egyptian. On the other hand, positional restrictions of certain graphemes with respect to word boundaries play an important role in Egyptian, more so than in our script. Most Egyptian words are written by a combination of phonograms and semograms (☞ § 2.5). The semograms are written at the end of a word and therefore also serve as indicators of segmentation. Most grammatical affixes are written only phonetically, which probably indicates that they are not considered "words" in this sense. Some of these suffixes may intervene between a lexical stem and the semogram belonging to it, whereas other suffixes follow the semogram (cf. Gardiner 1957: § 39, § 79, § 309, § 410). Semograms sometimes also refer to syntagms which may exceed the extent of a "word" (cf. Gardiner 1957: § 61, § 354). In Demotic, some phonograms (‹ꜣ›, ‹ỉ›, ‹w›, ‹s›) have specific sign forms for word-initial position and thus also indicate word boundaries.

There is a general tendency for Egyptian texts not to start a new line or column within the boundaries of a word (it has, however, not yet been examined what exactly counts as a word in this sense). This rule is observed strictly in the Old Egyptian Pyramid Texts (Sethe 1922: 9) as well as in Demotic. In many other hieroglyphic and hieratic texts, the rule is valid in a statistical rather than in a deterministic sense with quite a variety found throughout the texts (cf. der Manuelian 1994: 63-66 for texts from Dynasty 26). To cite an extreme case, the Late Egyptian literary text "Tale of Woe" (edited by Caminos 1977) pays very little regard to word boundaries when starting new lines.

A delicate issue is the relative arrangement of hieroglyphs within a line or column. Hieroglyphs can be written either in lines or in columns, but small signs are frequently arranged contrary to the main writing orientation in order to avoid free space (☞ § 2.5.3). It seems that in some texts attention is paid to ensure that signs that are arranged against the main writing orientation belong to one word or at least to one phrase.[362] The possibility of arranging signs contrary to the main writing orientation still exists in Hieratic and Demotic but is exploited to a somewhat lesser degree.

6.4.5 Intermediate units (phrases, words) in Coptic

Probably due to the influence of Greek, there are much fewer means of marking word boundaries in Coptic than in the Egyptian scripts. Neither are words separated by

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[362] Sethe (1922: 109-120) undertook a detailed examination of this phenomenon for the Pyramid Texts.

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spaces,[363] nor do signs exist which are restricted to use at the beginning or end of a word. Furthermore, Coptic texts do not hesitate to divide words across the lines, although morpheme or syllable boundaries seem to be observed at least to a degree. This issue is still to be investigated. For the Sahidic superlinear stroke as a possible marker of word boundaries ☞ § 2.7.5.

6.4.6 Small units (morphemes, syllables) in Egyptian

Egyptian has complex phonograms which express sequences of two (or even three) consonants. These signs are not usually employed for consonantal sequences exceeding the boundaries of a morpheme (☞ § 2.5.9).

6.4.7 Small units (morphemes, syllables) in Coptic

6.4.7.1 The influence of morpheme boundaries on Coptic spelling

Certain Coptic spelling conventions which are obligatory or at least common within a morpheme are restricted in use if a morpheme boundary intervenes. This concerns:

- the use of digraphs, i.e. letters which express a sequence of two phonemes (ⲑ, ⲝ, ⲫ, ⲭ, ⲯ, ϯ) (☞ 2.7.2);
- the notation of /u/~/w/ as ⲩ (instead of ⲟⲩ) after ⲁ or ⲉ (☞ § 2.7.4);
- the spelling of stops before sonorants with aspirate signs (ⲑ, ⲫ, ⲭ, ϭ) in Bohairic (☞ § 3.3.2).

The following chart summarizes to which extent different types of morpheme boundaries prohibit the use of such spellings. Cells in which spelling manifests the morpheme boundary are shaded, whereas cells in which spelling is the same as it could be within a morpheme are white. The data are based on an examination of Sahidic and Bohairic manuscripts of the New Testament. I tried to determine what is written in the overwhelming majority of cases. However the writings indicated are not without exception. Furthermore, it might be the case that other, in particular non-literary texts behave quite differently.

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363 Although Coptic manuscripts are generally written in *scripta continua*, modern editions of Coptic texts separate the words for the convenience of modern readers. In doing this, most editors nowadays follow the normative rules established by Till (1960).

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The lines in the chart refer to the following types of morphological compounding:

1) (definite) article (Ⲡ, Ⲧ, ⲚⲈ) + noun
2) preposition + pronominal suffix (-Ⲩ)
3) past tense prefix Ⲁ + pronominal infix (-Ⲩ; as a subject pronoun). I have not examined whether the other tense prefixes behave similarly.
4) infinitive of the verb + pronominal suffix (-Ⲩ, -Ⲥ; as an object pronoun)
5) preposition + (indefinite) article (ⲞⲨ)
6) past tense prefix Ⲁ + (indefinite) article
7) preposition (Ⲉ) + noun
8) past tense prefix Ⲁ + noun
9) nominal prefix ^{s,b}ⲀⲦ + (nominal or verbal) stem. This prefix forms nouns of negative or privative meaning.
10) nominal prefix ^{s}ⲘⲚⲦ, ^{b}ⲘⲈⲦ + nominal stem. This prefix forms abstract nouns.
11) relative clause marker ^{s,b}ⲈⲦ + verb
12) pronominal prefix (Ⲕ, ⲤⲈ; as a subject pronoun) + verb (present I tense)
13) tense prefix/ relative clause marker & pronominal infix (as a subject pronoun) (ⲈⲦⲈⲔ, ⲀⲔ, [Ⲛ]ⲦⲀ) + verb. I focus here on the junction between the pronominal infix and the verb.
14) definite article & pronominal infix (in possessive function) (ⲦⲈⲔ, ⲦⲀ, ⲠⲈⲔ) + noun. I focus on the junction between the pronominal infix and the noun.

The columns refer to the following graphical features of Coptic (S = Sahidic, B = Bohairic):

a) combinatory aspiration of stops: using Ⲫ, Ⲑ, Ϭ, Ⲭ instead of Ⲡ, Ⲧ, Ϫ, Ⲕ before a sonorant. This is only relevant for Bohairic since Sahidic never has the aspirate sign here.
b) use of the complex grapheme Ϯ for the sequence /ti/ (as opposed to ⲦⲒ or ⲦⲈⲒ)
c) ⲈⲨ/ ⲀⲨ as expressions of a sequence /eu/~/ew/ or /au/~/aw/ (as opposed to ⲈⲞⲨ, ⲀⲞⲨ)
d) Ⲫ, Ⲑ, Ⲭ as expressions of the phonemic sequences /ph/, /th/, /kh/ (as opposed to ⲠϨ, ⲦϨ, ⲔϨ). This is only relevant for Sahidic since Bohairic always has ⲠϨ, ⲦϨ, ⲔϨ here.
e) use of the complex graphemes Ⲝ and Ⲯ for the phonemic sequences /ks/ and /ps/ respectively (as opposed to ⲔⲤ and ⲠⲤ)

I cite one word in each cell for exemplification and provide an English gloss and one or two occurrences in a footnote. I have preferred occurrences where the Sahidic and Bohairic versions of the New Testament employ etymologically connected words so both dialects can be directly compared. For this reason, only the Sahidic form is accompanied by a footnote then.

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dialect	com. asp. B	ϯ S	ϯ B	ⲉⲩ, ⲁⲩ S	ⲉⲩ, ⲁⲩ B	ⲫ, ⲑ, ⲭ S	ⲝ, ⲯ S	ⲝ, ⲯ B
article + noun	ⲫⲣⲱⲙⲓ[364]	ϯⲣⲏⲛⲏ[365]	–	ⲛⲉⲩϩⲟⲟⲣ[366]	–	ⲡϩⲁⲧ[367] ⲑⲏ[368]	ⲡⲥⲱⲧⲏⲣ[369]	ⲡⲥⲱⲧⲏⲣ
prp + prn	–	–	–	ⲛⲁⲩ[370]	–	–	–	–
pst + prn	–	–	–	ⲁⲩ[371]	ⲁⲩ	–	–	–
verb + prn	–	–	–	ⲕⲁⲁⲩ[372]	ⲭⲁⲩ	–	ⲟⲡⲥ[373]	ⲟⲡⲥ
prep + art	–	–	–	ⲉⲩ[374]	ⲉⲟⲩ	–	–	–
pst + art	–	–	–	ⲁⲩ ~ ⲁⲟⲩ[375]	ⲁⲟⲩ	–	–	–
prp + noun	–	–	–	ⲉⲟⲩ[376]	ⲉⲟⲩ	–	–	–
pst + noun	–	–	–	ⲁⲟⲩⲁ[377]	ⲁⲟⲩⲁⲓ	–	–	–
ⲁⲧ + stem	ⲁⲑⲛⲁϩϯ ~ ⲁⲧⲛⲁϩϯ[378]	–	–	–	–	ⲁⲑⲏⲧ[379]	–	–
ⲙⲉⲧ + noun	ⲙⲉⲑⲙⲏⲓ[380]	–	–	–	–	ⲙⲛⲧϩⲏⲕⲉ[381]	–	–
ⲉⲧ + verb	ⲉⲑⲛⲏⲟⲩ[382]	ⲉⲧⲉⲓⲣⲉ ~ ⲉϯⲣⲉ[383]	ⲉⲧⲓⲣⲓ ~ ⲉϯⲣⲓ	–	–	ⲉⲧϩⲏⲡ ~ ⲉⲑⲏⲡ[384]	–	–
prn + verb	ⲭⲛⲁⲩ[385]	–	–	ⲥⲉⲟⲩⲁⲁⲃ[386]	ⲥⲉⲟⲩⲁⲃ	ⲕϩⲓⲟⲩⲉ[387]	ⲕⲥⲟⲟⲩⲛ[388]	ⲕⲥⲱⲟⲩⲛ
(tense & prn) + verb	ⲉⲧⲉⲕⲛⲁⲩ[389]/ⲁⲕⲛⲁⲩ[390]	–	–	ⲧⲁⲟⲩⲱⲙ[391]	ⲛⲧⲁⲟⲩⲱⲙ	ⲁⲕϩⲉ[392]	ⲁⲕⲥⲟⲃⲧⲉ[393]	ⲁⲕⲥⲉⲃⲧⲉ-
(art&prn) + noun	ⲧⲉⲕⲙⲁⲩ[394]	–	–	ⲧⲁⲟⲩⲛⲟⲩ[395]	ⲧⲁⲟⲩⲛⲟⲩ	ⲡⲉⲕϩⲏⲧ[396]	ⲡⲉⲕⲥⲟⲛ[397]	ⲡⲉⲕⲥⲟⲛ

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[364] “the man”, Mt 8:20. Sahidic ⲡⲣⲱⲙⲉ.

[365] “the peace”, Lc 1:79.

[366] “the dogs”, Mt 7:6. Bohairic ⲛⲓⲟⲩϩⲱⲣ; this form is indecisive since the sequence /iw/ is always written ⲓⲟⲩ in Bohairic.

[367] “the money”, Mt 25:18. Bohair. ⲡϩⲁⲧ.

[368] “the front”, Mt 4:21. Bohairic ⲧϩⲏ.

[369] “the savior”, 1 Ti 4:10.

[370] “to them”, Mt 3:7. The Bohairic equivalent ⲛⲱⲟⲩ is indecisive.

[371] “they did (...)”, Mt 2:1.

[372] “to put them”, Lc 8:32.

[373] “to count it”, Ro 4:3.

[374] “to a”, Mt 4:16.

[375] “a (...) did (...)”, Lc 4:36.

[376] “to what?”, Mt 11:7.

[377] “one did”, Jh 6:46.

[378] “unbelieving”, Mc 9:19. Sah. ⲁⲧⲛⲁϩⲧⲉ.

[379] “senseless”, Lc 11:40. Bohair. ⲁⲧϩⲏⲧ.

[380] “righteousness”, 1 Th 2:10. Sahidic ⲙⲛⲧⲙⲉ.

[381] “poverty”, 2 Co 8:2. Bohair. ⲙⲉⲧϩⲏⲕⲓ.

[382] “that will come”, Mt 3:11. Sah. ⲉⲧⲛⲏⲩ.

[383] “that does”, Mt 13:41, Joh 14:10.

[384] “that is hidden”, 1 Co 4:5. Boh. ⲉⲧϩⲏⲡ.

[385] “you are seeing”, Mc 5:31. Sah. ⲕⲛⲁⲩ.

[386] “they are clean”, 1 Co 7:14.

[387] “you beat”, Jh 18:23. Boh. ⲕϩⲓⲟⲩⲓ.

[388] “you know”, Mc 10:19.

[389] “that you are seeing”, Mc 8:23. Sahidic differently.

[390] “you saw”, Jh 20:29. Sahidic ⲁⲕⲛⲁⲩ.

[391] “I will eat”, Apc 3:20.

[392] “you fell”, Apc 2:5. Bohairic ⲁⲕϩⲉⲓ.

[393] “you prepared”, Mt 21:16.

[394] “your mother”, Mt 15:4. Sah. ⲧⲉⲕⲙⲁⲁⲩ.

[395] “my hour”, Jh 2:4.

[396] “your heart”, Mt 22:37. Boh. ⲡⲉⲕϩⲏⲧ.

[397] “your brother”, Mt 7:5.

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The results in brief:

- The digraphs ⲝ and ⲯ are never used across a morpheme boundary. Their use is not even obligatory within a morpheme, although they are preferred at least in morpheme-initial position, cf. ^{s}ⲧⲱⲕⲥ ~ ⲧⲱⲝ /'toks/ "to pierce", ^{s}ⲝⲟⲩⲣ ~ (rare:) ⲕⲥⲟⲩⲣ /'ksur/ "ring".
- The Sahidic aspirate digraphs ⲫ, ⲑ, and ⲭ, as well as ϯ are applied at certain morpheme boundaries only. It is curious to see that there is clearly a greater tendency for the feminine article ⲧ to merge with a following ϩ- into ⲑ- than for the masculine article ⲡ to merge with a following ϩ- into ⲫ-.
- The rules for writing combinatory aspiration in Bohairic seem to be complicated and deserve further exploration.
- I have only examined the writing of /u/~/w/, not of /i/~/j/ after ⲁ and ⲉ. In Bohairic, the short writing is used only with -ⲩ as a pronominal element, whereas its use is somewhat more extended in Sahidic.

6.4.7.2 Syllable marking in a Sahidic text

A Sahidic text from approximately the 5th century AD published by Pietersma & Comstock & Attridge (1979) employs raised dots (·) throughout which separate segments that seem to roughly correspond to syllables. This punctuation is somewhat inconsistent, but we can make the following observations which hold true for the majority of cases:

- The junctures marked by dots coincide with word boundaries, but not necessarily with morpheme boundaries: ⲉ·ⲃⲟⲗ·ⲉ·ⲧⲥⲱ·ϣⲉ "out to the field"[398].
- Word-initial or word-final consonant clusters are only separated if a syllabic sonorant is present: ϥⲛⲁ·ⲧⲣⲉ·ⲙ̄·ⲡⲟ /fnatrɛm̩'pɔ/ "he will make the dumb (speak)"[399], ⲡⲕⲁϩ·ⲧⲏⲣϥ /'pkah 'terf/ "the whole land"[400]; ϣⲟⲙⲛⲧ·ⲛ̄·ⲣ̄·ⲣⲟ "three kings"[401]. It is noteworthy that even consonant clusters accompanied by the superlinear stroke, which many scholars interpret as an indicator of syllabicity, are not isolated by a dot unless a syllabic sonorant is present: ⲛⲉ·ⲧⲟ̄ⲛ̄ϩ̄ /nə'tɔnh/ "those who live"[402]; ⲛ̄·ⲧⲟ·ⲟⲧ̄ϥ̄ /n̩'tɔ:tf/ "in his hand"[403].
- Word-internal consonant clusters can either be separated or taken to the following syllable: ⲛ̄·ⲧⲛⲏⲥ·ⲧⲓ·ⲁ "the fasting"[404]; ⲟⲩ·ⲛⲏ·ⲥⲧⲓ·ⲁ "a fasting".[405]

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[398] Pietersma *et al.* (1979: 26, line 13). Morpheme boundaries are: ⲉ(to)-ⲃⲟⲗ(outside)-ⲉ(to)-ⲧ(the)-ⲥⲱϣⲉ(field), with one word boundary: ⲉⲃⲟⲗ ⲉⲧⲥⲱϣⲉ.

[399] Pietersma *et al.* (1979: 44, line 8). ϥ(he)-ⲛⲁ(will)-ⲧⲣⲉ(cause)-ⲙⲡⲟ(dumb).

[400] Pietersma *et al.* (1979: 40, line 11). ⲡ(the)-ⲕⲁϩ(land)-ⲧⲏⲣ(all)-ϥ(it).

[401] Pietersma *et al.* (1979: 38, line 9). ϣⲟⲙⲛⲧ(three)-ⲛ(*attributive marker*)-ⲣⲣⲟ (king).

[402] Pietersma *et al.* (1979: 42, line 5). ⲛ(the)-ⲉⲧ(*relative pronoun*)-ⲟⲛϩ(live).

[403] Pietersma *et al.* (1979: 26, line 14). ⲛ(in)-ⲧⲟⲟⲧ(hand)-ϥ(he).

[404] Pietersma *et al.* (1979: 24, line 11). ⲛ(*object marker*)-ⲧ(the)-ⲛⲏⲥⲧⲓⲁ(fasting).

[405] Pietersma *et al.* (1979: 24, line 15). ⲟⲩ(a)-ⲛⲏⲥⲧⲓⲁ(fasting).

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- Glides in a stressed syllable are separated by a dot. Similarly, long vowels – which are always stressed – are divided by a dot. Glides in unstressed syllabes are not separated: ⲛ̄·ⲛⲉⲩ·ϩⲟ·ⲉⲓ·ⲧⲉ /n̥nəw'hɔjtə/ “their garments”[406]; ⲡⲉ·ⲟⲩ·ⲟ·ⲉⲓϣ /pə'wɔjʃ/ “the time”[407]; ⲉⲩ·ⲟⲩ·ⲁ·ⲁⲃ /əw'waːβ/ “which are holy”[408].

Note the contrast between ⲛⲟⲩ·ⲉⲓ /'nuj/ “mine”[409] with consonantal ⲛ and ⲛ̄·ⲟⲩ·ⲙⲟⲩ·ⲉⲓ /n̥u'muj/ “of a lion”[410] with syllabic ⲛ.

6.5 Metrics

A text is metrically formed if its prosodic realization is quantitatively structured in a well-defined manner. Metrics is a major feature of poetic texts and seems to be universal, but the mechanics of metrics, i.e. the exact definition of how a metrical text has to be formed, differs across the languages. The following criteria seem to be universal: A text that is metrically formed can be typically divided into units (called verses or cola). The boundaries of these units can be, but need not be, explicitly marked, e.g. by rhyme or by obligatory coincidence with syntactic boundaries. Each of the units is characterized by a predetermined prosodic structure, e.g. by a constant number of syllables (as is usual for poetry e.g. in English, French, Chinese, and Japanese) or by a constant number of moræ (e.g. in Arabic and Classical Greek). The internal structuring of a metrical unit can be, but need not be, refined by further prosodic requirements, e.g. by a pattern of alternating stressed and unstressed syllables (English, but not French) or by a pattern of alternating tones (Chinese).

There are looser forms of metrically formed literature on the borderline between prose and poetry: The Arabic Qur'an, for example, consists of verses defined by rhyme but lacking a fixed internal prosodic structure. Even less strictly formed are the so-called “free rhythms” known from modern poetry.

Poetry is a cross-cultural phenomenon, and it is to be assumed that it also existed in Ancient Egypt. Due to our restricted knowledge about vowels and syllables of the

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[406] Pietersma *et al.* (1979: 34, line 9). ⲛ(*object marker*)-ⲛⲉ(*possessive article*)-ⲩ(they)-ϩⲟⲉⲓⲧⲉ(garments).

[407] Pietersma *et al.* (1979: 38, line 5). ⲡⲉ(the)-ⲟⲩⲟⲉⲓϣ(time).

[408] Pietersma *et al.* (1979: 26, line 6). ⲉ(*conjugation prefix*)-ⲩ(they)-ⲟⲩⲁⲁⲃ(holy).

[409] Pietersma *et al.* (1979: 28, line 6). ⲛⲟⲩ(*possessive article*)-ⲉⲓ(my).

[410] Pietersma *et al.* (1979: 28, line 19). ⲛ(of)-ⲟⲩ(a)-ⲙⲟⲩⲉⲓ(lion).

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Egyptian language, the mechanics of Egyptian metrics have not yet been discovered.[411] Therefore we have no certain means of distinguishing between prose and poetry in the Egyptian literature.

Prospects for discovering the rules of metrics are probably best for Coptic since this stage of Egyptian is the best known phonologically. Junker (1908/11), von Lemm (1903), and Elanskaya (1969: 121-150) have published Coptic texts which are written in lines and end in a clearly visible rhyme. These texts seem to be likely candidates for being metrically formed. Attempts, however, to identify a stress-based metrical pattern in these texts (Junker 1908/11: I, 35-56) have not proved convincing.

An example of Demotic poetry might be expected in a bilingual text from ca. 200AD published by Brunsch (1979). The Demotic text is accompanied by a Greek translation which is composed in three different meters (dactylic distich, catalectic jambic tetrameter, sotadeus).

From the earlier periods, texts written in lines that are candidates for poetry can hardly be found. However numerous hieratic literary manuscripts from the New Kingdom have points inserted in red color which are distributed in rather regular intervals; Egyptologists traditionally call them "verse points". Most (not all) of these points coincide with syntactic boundaries, however the obvious regularity of the interval size can be taken as an indication that these points in fact mark verse boundaries. In a recent approach, Zeidler (1996) suggests that the metrics of these texts is based on counting moræ; it is not yet clear whether his attempt will prove successful.

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[411] Attempts to define Egyptian metrics on a purely syntactic (Fecht 1963 and 1982) or semantic (Foster 1975) base without paying any attention to the syllable structure of the words involved are certainly erroneous, although many, perhaps most Egyptologists have accepted one of these systems or a derivation thereof (cf., to cite only a few of them, Burkhard 1983 and Mathieu 1988). For criticism see Lichtheim (1971/72), Schenkel (1972), and Zeidler (1996).

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Prospects for discovering the rules of metrics are probably best for Coptic since this stage of Egyptian is the best known phonologically. JUNKER (1908/11), VON LEMM (1908) and ELANSKAYA (1960: 121-129) have published Coptic texts which are written in lines and end in a clearly visible rhyme. These texts seem to be likely candidates for being metrically formed. Attempts, however, to identify a stress-based metrical pattern in these texts (JUNKER 1908/11: I, 35-56) have not proved convincing.

An example of Demotic poetry might be expected in a bilingual text from ca. 200AD published by BRESCIANI (1979). The Demotic text is accompanied by a Greek translation which is composed in three different metres (dactylic distich, catalectic iambic tetrameter, [illegible]).

From the earlier periods, texts written in lines that are candidates for poetry can hardly be found. However numerous hieratic literary manuscripts from the New Kingdom bear points inserted in red colour which are distributed in rather regular intervals. Egyptologists traditionally call these "verse-points". Most (but not all) of these points coincide with syntactic boundaries. However the obvious regularity of the intervals can be taken as an indication that these points (or intervals) were boundaries. In a recent approach, [illegible] suggests that the metrics of these texts is based on counting [illegible], it is not yet clear whether his attempt will prove successful.

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[41] Attempts to define Egyptian metrics on a purely syntactic (FECHT [illegible]) or semantic (FOSTER 1975) base without paying any attention to the syllabic structure of the words involved seem hardly convincing, although many, perhaps most Egyptologists have accepted one of them. [illegible] only a few of them. [illegible] (1974/75), SCHENKEL (1993) and [illegible] (1996).

Appendix 1 Frequency of consonants in Middle Egyptian

The statistics in appendices 1 and 2 are based on the Coffin Text Word Index by van der Plas (1996). I elicited the data together with Frank Kammerzell (Göttingen). Only those entries in the Coffin Text Word Index were considered which have a length of exactly three characters where none of the characters is a structural sign (-) or (.). This selection was done with the purpose of mechanically reducing the number of morphologically complex words to a minimum. This involves other side-effects such as the following:

- Numerous words for which van der Plas gives variant readings are disregarded (such as *itn/iṯn* "sundisk", entry of 7 characters)
- Verbs are overrepresented in our corpus.
- Nouns of grammatical female gender are disregarded since the feminine suffix is transcribed *.t*, so all these nouns contain the structural sign (.).

The separation and interpretation of lexical entries are generally accepted as it was done by van der Plas. Possible reinterpretations of certain passages of the Coffin Texts would probably not have statistically important effects on our results since they would primarily concern rare lexical elements.

It should be noted that most verbs terminating in *-j* belong to the class of *verba tertiæ infirmæ* in which *-j* is rarely ever written in Egyptian and the reality of this consonant may be subject to doubt (☞ § 2.6.4). These cases form about half of all the words (contributing to about 80% of the token occurrences) which are listed with *-j* as the third consonant in the following charts.

It is further to be noticed that morphologically variable words are recorded under the base form chosen by van der Plas, e.g. all occurrences of the verb "to see" (allomorphs *mꜣꜣ*, *mꜣ*, *mꜣn*) are treated as if they were written *mꜣꜣ*. Such cases are however not frequent.

Any interventions into the given data base have been kept to a minimum. Only the following changes were made:

- In contrast to van der Plas, we distinguished between the consonants *s* and *z*. There are, however, several words in which the attribution to either phoneme remains uncertain. This concerns all words that are not attested prior to the Middle Kingdom, when graphic variation between *s* and *z* had already begun. In cases of doubt, we chose *s* rather than *z* because of the generally higher frequency of the former. The errors to be expected by possible misassignment are not likely to be major since doubtful words are usually infrequent ones.
- The *j*-signs (*ỉ*, *y*, *ï*, *i̯*), which van der Plas distinguished only inconsistently, have all been put into a single category *j*.
- The transcription of the frequent verb *rdj* "to give, to cause" (1351 occurrences) was changed into more accurate *rḏj*.
- The following 12 causative verbs, i.e. verbs with a causative prefix *s*-, which are attested so frequently as to potentially have disturbing effects on the statistics, have been eliminated from the data base:

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sšm “to guide”	143 occurrences	*smn* “to make firm”	107 occurrences
sfḫ “to release”	58 occurrences	*sḏꜣ* “to travel”	40 occurrences
sꜣḫ “to glorify”	38 occurrences	*sjp* “to examine”	35 occurrences
sḫr “to throw down”	34 occurrences	*srs* “to awaken”	20 occurrences
sḥḏ “to illumine”	24 occurrences	*sʿq* “to cause to enter”	15 occurrences
srd “to cause to grow”	12 occurrences	*sgr* “to make silent”	10 occurrences

Causative verbs of lower frequency have been left in the list as they are. For many of these, the decision as to whether initial *s-* is a causative morpheme or not would have been difficult to make.

In the following, each of the 24 transcription symbols which we distinguished are listed together with their token-frequency (number of occurrences of the relevant letter in the database) and its type-frequency (number of different lexical entries in the database which contain the letter). If a letter appears more than once in a word, this only affects the counting of tokens (e.g. each occurrence of the word *mꜣꜣ* is counted as two tokens with respect to the consonant *ꜣ*, but this is still only one type). We counted separately how often each consonant occurs as the first, the second, and the third consonant in a word.

cons.	sum		1st		2nd		3rd	
	token	type	token	type	token	type	token	type
j	9751	446	2493	133	567	47	6691	279
n	9606	517	3550	166	4782	242	1274	146
r	7695	244	1800	41	2431	107	3464	110
w	7363	524	2515	130	1719	117	3129	295
ꜣ	5506	480	232	38	3017	271	2257	187
m	5007	301	1918	105	1391	107	1698	92
s	4520	454	3003	307	1072	99	445	77
ḥ	3633	273	1916	135	895	65	822	84
ḫ	3432	203	1820	100	787	67	825	43
ʿ	3308	189	1302	89	903	61	1103	52
ḏ	3165	155	557	52	1955	53	653	55
p	2890	159	1245	59	1011	52	634	50
ṯ	2679	113	668	54	1790	34	221	30
t	2400	195	238	42	1298	92	864	76
k	2359	90	297	31	423	43	1639	21
b	1978	248	263	54	1099	119	616	76
d	1782	186	424	56	997	72	361	65
z	1379	85	743	44	501	31	135	12
f	1201	95	307	16	462	42	432	38
š	1102	163	749	81	226	52	127	34
h	976	75	870	34	106	42	0	0
q	728	98	388	48	187	26	153	24
ẖ	512	35	192	25	121	6	199	4
g	464	70	322	32	72	25	70	22
Σ	83436		27812		27812		27812	

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Appendix 2 Consonantal compatibility in Middle Egyptian

The following charts are based on exactly the same data base which was counted in appendix 1, with the same selections and corrections made. They show how often two consonants co-occur within a word. I indicate:

a) the token-frequency (total number of words, i.e. word tokens, in which both consonants occur at least once each) statistically to be expected according to the consonant frequency indicated in appendix 1 under the assumption that the occurrence of two consonants within a word were independent from each other[412]

b) the token-frequency actually attested

c) the attested type-frequency (number of different words in which both consonants occur at least once each)

	a)	b)	c)		a)	b)	c)		a)	b)	c)
j + *j*	2694	311	13	*j* + *n*	2659	2421	115	*j* + *r*	2181	2877	45
j + *w*	2095	1241	85	*j* + *ꜣ*	1603	1255	76	*j* + *m*	1467	1126	65
j + *s*	1332	665	71	*j* + *ḥ*	1082	718	55	*j* + *ḫ*	1025	340	22
j + *ʿ*	989	399	17	*j* + *ḏ*	948	1547	11	*j* + *p*	869	1096	22
j + *ṯ*	807	285	31	*j* + *t*	726	516	36	*j* + *k*	714	1589	19
j + *b*	601	469	45	*j* + *d*	543	433	27	*j* + *z*	422	356	15
j + *f*	368	141	8	*j* + *š*	338	220	29	*j* + *h*	300	350	25
j + *q*	225	176	19	*j* + *ẖ*	158	125	9	*j* + *g*	144	127	11
n + *n*	2624	607	37	*n* + *r*	2152	2041	28	*n* + *w*	2068	1701	102
n + *ꜣ*	1582	75	26	*n* + *m*	1447	1128	68	*n* + *s*	1314	537	100
n + *ḥ*	1068	949	61	*n* + *ḫ*	1011	1126	65	*n* + *ʿ*	976	1188	35
n + *ḏ*	936	360	29	*n* + *p*	857	114	24	*n* + *ṯ*	797	1772	34
n + *t*	716	565	39	*n* + *k*	704	1523	19	*n* + *b*	593	364	57
n + *d*	536	191	30	*n* + *z*	417	175	17	*n* + *f*	364	379	29
n + *š*	334	144	33	*n* + *h*	296	125	26	*n* + *q*	222	76	16
n + *ẖ*	156	103	14	*n* + *g*	142	40	11				
r + *r*	1765	57	14	*r* + *w*	1696	1244	68	*r* + *ꜣ*	1298	225	17
r + *m*	1187	436	26	*r* + *s*	1078	463	48	*r* + *ḥ*	876	318	20
r + *ḫ*	830	675	16	*r* + *ʿ*	801	179	14	*r* + *ḏ*	768	1651	16
r + *p*	703	1524	22	*r* + *ṯ*	654	1744	8	*r* + *t*	587	151	17

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[412] The expected co-occurrence frequency (f_c) is calculated by the following formula:

$f_c = (1 - f_a / s)^3) * (1 - f_b / s)^3) * s / 3$

(f_a = total token-frequency of one consonant; f_b = total token frequency of the other consonant; s = 83436, i.e. the total number of consonants in the data base).

Example: The consonants *s* and *h* are attested 4520 and 976 times respectively in our database (☞ appendix 1). Out of 83436/3 = 27812 words in our database, we would expect $(1 - 4520 / 83436)^3) * (1 - 976 / 83436)^3) * 83436 / 3 = 148$ of them to contain both *s* and *h*. However only three such words are attested. This indicates that there is a strong restriction against the co-occurrence of *s* and *h* within a morphologically non-complex word.

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r + k	578	204	8	*r + b*	487	20	3	*r + d*	439	64	18
r + z	342	134	5	*r + f*	298	245	13	*r + š*	274	114	22
r + h	243	423	10	*r + q*	182	105	22	*r + ẖ*	128	192	8
r + g	116	168	11								
w + w	1630	199	18	*w + ꜣ*	1247	1523	128	*w + m*	1141	1067	47
w + s	1036	616	77	*w + ḥ*	842	595	59	*w + ḫ*	797	486	45
w + ʿ	769	556	45	*w + ḏ*	737	526	44	*w + p*	676	180	21
w + ṯ	628	444	23	*w + t*	564	501	41	*w + k*	555	154	12
w + b	468	465	47	*w + d*	422	784	40	*w + z*	328	366	17
w + f	287	261	14	*w + š*	263	184	35	*w + h*	234	538	24
w + q	175	21	4	*w + ẖ*	123	22	7	*w + g*	112	62	16
ꜣ + ꜣ	954	566	17	*ꜣ + m*	873	1002	54	*ꜣ + s*	793	858	81
ꜣ + ḥ	644	395	50	*ꜣ + ḫ*	610	151	35	*ꜣ + ʿ*	589	274	53
ꜣ + ḏ	564	392	43	*ꜣ + p*	517	157	30	*ꜣ + ṯ*	480	279	18
ꜣ + t	432	127	17	*ꜣ + k*	425	242	34	*ꜣ + b*	358	571	73
ꜣ + d	323	204	27	*ꜣ + z*	251	392	31	*ꜣ + f*	219	113	22
ꜣ + š	201	189	37	*ꜣ + h*	179	352	16	*ꜣ + q*	134	425	34
ꜣ + ẖ	94	5	5	*ꜣ + g*	85	71	24				
m + m	799	18	3	*m + s*	725	1047	74	*m + ḥ*	589	552	41
m + ḫ	558	649	32	*m + ʿ*	539	460	32	*m + ḏ*	516	357	19
m + p	473	0	0	*m + ṯ*	440	194	17	*m + t*	395	460	35
m + k	389	55	8	*m + b*	327	1	1	*m + d*	296	453	26
m + z	230	122	5	*m + f*	201	1	1	*m + š*	184	68	14
m + h	163	31	10	*m + q*	122	92	9	*m + ẖ*	86	29	4
m + g	78	105	2								
s + s	659	35	8	*s + ḥ*	535	415	47	*s + ḫ*	507	875	48
s + ʿ	489	196	16	*s + ḏ*	469	556	34	*s + p*	429	368	44
s + ṯ	399	115	25	*s + t*	359	378	35	*s + k*	353	179	22
s + b	297	451	62	*s + d*	268	230	46	*s + z*	209	11	2
s + f	182	282	20	*s + š*	167	270	41	*s + h*	148	3	2
s + q	111	186	23	*s + ẖ*	78	199	4	*s + g*	71	25	13
ḥ + ḥ	435	183	11	*ḥ + ḫ*	412	0	0	*ḥ + ʿ*	397	993	26
ḥ + ḏ	381	78	17	*ḥ + p*	349	330	15	*ḥ + ṯ*	324	7	5
ḥ + t	292	409	27	*ḥ + k*	287	35	9	*ḥ + b*	241	195	29
ḥ + d	218	77	18	*ḥ + z*	170	89	11	*ḥ + f*	148	27	5
ḥ + š	136	1	1	*ḥ + h*	121	0	0	*ḥ + q*	90	118	15
ḥ + ẖ	64	0	0	*ḥ + g*	58	116	9				
ḫ + ḫ	390	29	7	*ḫ + ʿ*	376	968	18	*ḫ + ḏ*	361	7	4
ḫ + p	330	433	16	*ḫ + ṯ*	307	0	0	*ḫ + t*	276	349	33
ḫ + k	271	0	0	*ḫ + b*	229	36	17	*ḫ + d*	207	120	13
ḫ + z	161	106	9	*ḫ + f*	140	370	12	*ḫ + š*	129	21	4
ḫ + h	114	0	0	*ḫ + q*	85	0	0	*ḫ + ẖ*	60	0	0
ḫ + g	55	0	0								
ʿ + ʿ	363	241	13	*ʿ + ḏ*	348	203	20	*ʿ + p*	319	158	5
ʿ + ṯ	296	1	1	*ʿ + t*	266	2	2	*ʿ + k*	262	0	0
ʿ + b	221	307	26	*ʿ + d*	199	1	1	*ʿ + z*	155	0	0

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ʿ + *f*	135	60	10	ʿ + *š*	124	64	15	ʿ + *h*	110	1	1
ʿ + *q*	82	70	9	ʿ + *ẖ*	58	18	6	ʿ + *g*	53	13	5
ḏ + *ḏ*	334	7	5	*ḏ* + *p*	306	93	10	*ḏ* + *ṯ*	284	1	1
ḏ + *t*	255	0	0	*ḏ* + *k*	251	0	0	*ḏ* + *b*	212	237	30
ḏ + *d*	191	222	15	*ḏ* + *z*	149	0	0	*ḏ* + *f*	130	73	8
ḏ + *š*	119	0	0	*ḏ* + *h*	106	0	0	*ḏ* + *q*	79	0	0
ḏ + *ẖ*	56	0	0	*ḏ* + *g*	51	0	0				
p + *p*	280	4	2	*p* + *ṯ*	260	17	3	*p* + *t*	234	426	19
p + *k*	230	9	4	*p* + *b*	194	0	0	*p* + *d*	175	89	13
p + *z*	136	244	13	*p* + *f*	119	7	2	*p* + *š*	109	333	25
p + *h*	97	18	7	*p* + *q*	72	19	3	*p* + *ẖ*	51	108	3
p + *g*	46	34	9								
ṯ + *ṯ*	242	12	5	*ṯ* + *t*	217	167	19	*ṯ* + *k*	214	0	0
ṯ + *b*	180	19	10	*ṯ* + *d*	163	2	2	*ṯ* + *z*	126	239	13
ṯ + *f*	110	27	7	*ṯ* + *š*	101	4	1	*ṯ* + *h*	90	3	1
ṯ + *q*	67	1	1	*ṯ* + *ẖ*	47	0	0	*ṯ* + *g*	43	0	0
t + *t*	195	84	15	*t* + *k*	192	55	11	*t* + *b*	162	8	5
t + *d*	146	0	0	*t* + *z*	114	2	1	*t* + *f*	99	141	10
t + *š*	91	73	11	*t* + *h*	81	23	9	*t* + *q*	61	1	1
t + *ẖ*	43	197	2	*t* + *g*	39	51	4				
k + *k*	189	109	5	*k* + *b*	159	165	12	*k* + *d*	144	0	0
k + *z*	112	44	2	*k* + *f*	98	11	4	*k* + *š*	90	2	2
k + *h*	80	5	1	*k* + *q*	59	0	0	*k* + *ẖ*	42	0	0
k + *g*	38	0	0								
b + *b*	134	9	1	*b* + *d*	121	190	21	*b* + *z*	94	193	13
b + *f*	82	1	1	*b* + *š*	76	68	14	*b* + *h*	67	50	3
b + *q*	50	83	10	*b* + *ẖ*	35	2	2	*b* + *g*	32	13	8
d + *d*	109	19	7	*d* + *z*	85	0	0	*d* + *f*	74	191	9
d + *š*	68	182	25	*d* + *h*	60	13	9	*d* + *q*	45	39	15
d + *ẖ*	32	13	2	*d* + *g*	29	7	6				
z + *z*	66	18	2	*z* + *f*	58	22	5	*z* + *š*	53	207	7
z + *h*	47	0	0	*z* + *q*	35	0	0	*z* + *ẖ*	25	1	1
z + *g*	23	0	0								
f + *f*	50	6	1	*f* + *š*	46	2	1	*f* + *h*	41	0	0
f + *q*	31	16	7	*f* + *ẖ*	22	0	0	*f* + *g*	20	14	1
š + *š*	43	8	4	*š* + *h*	38	0	0	*š* + *q*	28	0	0
š + *ẖ*	20	0	0	*š* + *g*	18	0	0				
h + *h*	33	1	1	*h* + *q*	25	0	0	*h* + *ẖ*	18	0	0
h + *g*	16	0	0								
q + *q*	19	0	0	*q* + *ẖ*	13	3	1	*q* + *g*	12	0	0
ẖ + *ẖ*	9	0	0	*ẖ* + *g*	8	0	0				
g + *g*	8	27	9								

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Appendix 3 The Egyptian numerals from 3 to 10 in cuneiform transcription

Bi- and multilingual glossaries ("lexical lists") have a long tradition in the cuneiform literature. They cover approximately 20 different languages altogether and have played a crucial role in deciphering some of them (e.g. Sumerian, Eblaitic), whereas some of these languages are not even attested by texts yet (e.g. Kassite, Lullubaean). Only one glossary involving Egyptian has been found by now. This is an Egyptian-Akkadian glossary from the 14th century BC which was excavated in Tell el-Amarna in Middle Egypt. This text is supposed to have been written by an Asian with the purpose either of memorizing Egyptian words or of providing a tool for teaching Egyptian to others.

Its special importance lies in the fact that the Egyptian words are not written in an Egyptian script but with cuneiform phonograms. Among other items of everyday vocabulary, the glossary contains the numbers from 3 to 10 which I list in the following along with the Egyptian and the equivalent Coptic forms.

The text was first published by Smith & Gadd (1925). For more recent discussions of the text relevant for the reading of the numbers see Edel (1975 and 1994b) and Kammerzell (1994b: 169).

	Egyptian	cuneiform renderings: transliteration	cuneiform renderings: possible transcription	Akhmimic Coptic	Sahidic Coptic
3	*ḫmtw*	ḪA-AM-TUM	*ḫamtu*[413]	ϩⲁⲙⲧ /ˈxamt/	ϣⲟⲙⲛⲧ /ˈʃɔmt/
4	*fdw*	⸢BI⸣-⸢DA⸣-Ú	*piṭau*[414]	ϥⲧⲁⲩ /ˈftaw/	ϥⲧⲟⲟⲩ /ˈftɔw/
5	*diw*	DÍ-Ú	*ṭiu*	ϯⲟⲩ /ˈtiw/	ϯⲟⲩ /ˈtiw/
6	*ỉsw*	⸢IS⸣-ŠA-Ú	*ĭššau*	ⲥⲁⲩ /ˈsaw/	ⲥⲟⲟⲩ /ˈsɔw/
7	*sfḫw*	ŠAB-ḪA	*šapḫa*	ⲥⲁϩϥ /ˈsaxf/	ⲥⲁϣϥ /ˈsaʃf/
8	*ḫmnw*	ḪA-MA-AN	*ḫaman*	ϩⲙⲟⲩⲛ /ˈxmun/	ϣⲙⲟⲩⲛ /ˈʃmun/
9	*psḏw*	PI-ŠI-ID	*pišiṭ*	ⲯⲓⲥ /ˈpsis/	ⲯⲓⲥ /ˈpsis/ ~ ⲯⲓⲧ /ˈpsit/
10	*mḏw*	MU-ṬU	*muṭu*	ⲙⲏⲧ /ˈmet/	ⲙⲏⲧ /ˈmet/

---

[413] The sign TUM can be read *tu* at the end of a word (and is conventionally transliterated tu_4 then).

[414] Cuneiform has no grapheme to express /f/.

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Appendix 4 Word forms in Sinuhe still found in Coptic

The study of Egyptian syllable structures is based on the observation that the openness vs. closeness of the stressed vowel in Coptic is predictable from the number of consonants which followed it in the earlier language (☞ § 4.2). This correlation is widely believed in, but there has never been a quantitative examination of the topic.

The following chart compares actual writings of words from Middle Egyptian and from Coptic and checks whether the rule is confirmed or not. The Egyptian data are taken from papyrus 3022 Berlin (edited by Gardiner 1909) from the 2nd half of 12th Dynasty, the best preserved and the oldest known manuscript of the literary tale of Sinuhe, which is perhaps the most studied piece of classical Egyptian literature. This famous text is generally considered representative of standard Middle Egyptian and dates roughly to the time at which the syllable structure rules reconstructed for Paleo-Coptic might have applied. The chart contains all words of this manuscript for which an exact genetic equivalent is still attested more than 2000 years later in Coptic.

The following criteria have been applied for carrying out the comparison:

- I only compare words that, according to our present knowledge, share the same morphological form in both the Sinuhe text and in Coptic. This implies that most finite verbal forms of Sinuhe have to be disregarded.
- I do compare status nominalis / pronominalis forms of nouns (including infinitives) from Sinuhe with status absolutus forms from Coptic. With rare exceptions, the different status are not distinguished in Middle Egyptian writing, so the status absolutus of the noun would probably have been written no differently in the Sinuhe manuscript.
- If a lexical base takes an obligatory pronominal suffix in Coptic, I choose the suffix -ϥ (3rd pers. sg. masc.). A combination with any other suffix would yield the same conclusions concerning the syllable structure.
- I prefer comparisons with the Sahidic dialect of Coptic, but other dialects are adduced if no Sahidic cognate is available. I do not include Old Coptic attestations because writing is so inconsistent here that high and low vowels cannot be clearly distinguished.
- I do not consider clitics which have no own word stress in Coptic since they cannot be used for reconstructing Paleo-Coptic syllable structures.
- If there is some doubt about the etymological connection between the Egyptian and the Coptic word (especially for semantic divergence), this is indicated by "?".
- In some cases where I doubt the morphological identity, the word is marked as "?m" ("morphologically questionable"). This especially concerns certain nouns whose grammatical number is difficult to determine in the Sinuhe text.

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The chart contains the following entries:

1) The Egyptian word. In order to avoid circulary argumentation, the words are transcribed as actually written in the manuscript, rather than as recorded in the dictionaries. This is because the dictionaries frequently reconstruct the consonantal representation of a word with respect to its Coptic cognate. Consonants are italicized if they are not expressed by mono-consonantal phonograms (but instead by complex phonograms or by logograms) to indicate that their identification implies additional assumptions.

2) The place of attestation in the Sinuhe manuscript (line/ column).

3) The Coptic cognate.

4) An English gloss, which in case of difference is of the Egyptian rather than of the Coptic word.

5) An indication as to whether the comparison confirms the suspected correlation or not:

   "+": A vowel which is high in Coptic is followed by two consonants in the Sinuhe text, or a vowel which is low in Coptic is followed by one or three of consonants in the Sinuhe text: The rule is confirmed.

   "–": The relation is the contrary: The rule is violated.

   "?": Evidence is ambiguous, e.g. because it is unclear where the stressed vowel is to be placed within the Egyptian consonantal skeleton.

   In all cases in which doubt is possible (writing in Sinuhe not exclusively with monoconsonantal signs, doubtful etymology), the symbol is put in brackets ( ). I found it unnecessary to distinguish between "?" and "(?)".

   No syllable structure rules are presupposed: I do not rule out the possibility that Egyptian words begin or end in a vowel, that more than three consonants can follow the stressed vowel, etc.

Examples: In ⲟⲩⲱϣⲃ < wšb "to answer" there is no doubt that the predecessor of the high Coptic stressed vowel ⲱ was between *w* and *š* in Egyptian. The vowel was followed by two consonants which conforms to the rule: "+". In ⲉⲓⲟⲡⲉ < *ỉ*pw.t "commission", it is evident that the stressed vowel was between *ỉ* and *p*, which would likewise conform to the rule. However the consonant *ỉ* is only written by means of a complex phonogram ‹ip›. This entry is therefore marked as "(+)". In ⲏⲣⲡ < ỉrp "wine" it cannot be determined without further presuppositions whether the Egyptian forerunner of ⲏ preceded or followed *ỉ*, i.e. whether two or three consonants followed the stressed vowel in Egyptian. This entry is marked as ambiguous "?". In words like ⲡⲉ < p.t "heaven" I presuppose the well established rule that *t* is not lost before the stressed vowel. Thus I assume that the stressed vowel must have preceded *t*, i.e. the rule is confirmed: "+".

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1)	2)	3)	4)	5)
ꜣbw	226	ⲓⲏⲃ	Elephantine (town)	(+)
ꜣpd	88	ⲱⲃⲧ ?m	birds (coll.)	?
ꜣḥ.t	306	ⲉⲓⲁϩⲟⲩ ?m	fields	(–)
ꜣd.w	255	ⲟⲟⲧ (qual.)	to be in bad mood	?
ỉꜣ.t	141	ⲱⲱ-	back	?
ỉꜣb.tï ~ *ỉꜣb.tï*	14, 208	ⲉⲓⲉⲃⲧ	east	?
ỉꜣrr.t	82	ⲉⲗⲟⲟⲗⲉ ?m	grapes (coll.)	(–)
ỉꜥ	149	ⲉⲓⲏ	to wash (stative)	?
*ỉ*w.t	109, 188, 236, 241, 248	ⲉⲓ	to come	?
ỉb.t	21	ⲉⲓⲃⲉ ?m	thirst	?
ỉf	88	ⲁϥ	meat	+
ỉm-	67, 68, 82, 104, 148, 160, 164 etc.	ⲙ-ⲙⲟ-ϥ	in ...	+
ỉm	257, 275f.	ⲙⲁ ?m	give!	(–)
ỉmn	180, 206	^{b}ⲁⲙⲟⲩⲛ	Amun (god)	(–)
ỉmn.tï	14	ⲉⲙⲛⲧ	west	(+)
ỉn.t-	178	ⲉⲓⲛⲉ	to bring	?
ỉnm	198	ⲁⲛⲟⲙ	skin	+
ỉnr	300	ⲱⲛⲉ	stone	?
ỉnr	196?	ⲱⲛⲉ ?m	stone	?
ỉnk	154, 230	ⲁⲛⲟⲕ	I	(+)
ỉpw.t	117, 177, 243	ⲉⲓⲟⲡⲉ	commission	(+)
ỉr.t	279	^{l}ⲉⲓⲣⲉ	eye	(+)
ỉr.t ~ *ỉr*.t	5 bis, 117, 250, 299	ⲉⲓⲣⲉ	to do	?
ỉry-	100, 203	in (ⲧ)ⲣⲉ-ϥ	to do (subjunctive)	?
ỉrp	82, 87	ⲏⲣⲡ	wine	?
ỉrṯ.t	27, 91	ⲉⲣⲱⲧⲉ	milk	(+)
ỉḥ.w	194	in (ⲧⲡ)ⲏϩ	oxen	?
ỉḫ.t	161	ⲁϣ ?	thing	?
[ỉ]sṯ	1	ⲉⲓⲥ ?	(particle)	?
ỉt	84	ⲉⲓⲱⲧ	barley	(–)
ỉtỉ	47, 50	ⲉⲓⲱⲧ	father	(+)
ỉtm	207	in the toponym ^{b}(ⲡⲉ)ⲑⲱⲙ	Atum (god)	–
ỉtrw	233	ⲉⲓⲟⲟⲣ	river	+
ỉtḥ	194	ⲱⲧϩ	to pull	?
ỉṯ.t	71	ϫⲓ ?	to take	(–)
ꜥꜣ	65, 216, 265	ⲟ	great	?
ꜥꜣ	77	ⲧⲁⲓ	here	+
ꜥb	54	ⲧⲁⲡ	horn	+
ꜥnḫ	7, 162	ⲱⲛϩ	to live	?
ꜥnḫ ~ *ꜥnḫ*	211, 256, 271	ⲱⲛϩ	life	?
ꜥḥꜥ	10	ⲁϩⲉ ?m	to stand (stative)	?
ꜥḥꜥ	147	ⲁϩⲱⲱⲣ ?m	treasures	?
ꜥšꜣ.t	59	ⲁϣⲏ	crowd	?
ꜥq	46	^{l}ⲏⲕ	to enter (stative)	?
ꜥ*q*w	87	ⲟⲉⲓⲕ	income (coll.)	?
*w*ꜣ.t ~ *w*ꜣ.t	5, 16, 97, 251	ⲟⲩⲟⲉⲓ	way	–
*w*ꜥ	1, 70, 137, 137, 246, 256	ⲟⲩⲁ	one	?
*w*ꜥ.t	266	ⲟⲩⲉⲓ	one (feminine)	?
*wḥ*m	124, 216	ⲟⲩⲱϩⲙ	to repeat	(+)
wšb	260	ⲟⲩⲱϣⲃ	answer	+

wšd	254	ⲞⲨⲰϢⲦ	to greet	+
wḏꜣ	171	ⲞⲨⲈⲒⲦⲈ	to leave	(+)
bꜣ.t	18	ⲂⲰ	bush	?
bꜣḥ	253, 263	ⲂⲀϨ	penis	?
*b*ꜣk	175, 178, 202, 204, 205, 213, 215, 217 etc.	ᵇⲂⲰⲔ	servant	?
by.t	83	ⲈⲂⲒⲰ	honey	(–)
*b*d.t	84	ⲂⲰⲦⲈ	emmer	(+)
p.t	185, 193, 234, 270	ⲠⲈ	sky	+
*p*ꜣq.t	293	ⲠⲞⲔ(Ϥ) ?m	fine linen	?
pr	155	(ϪⲈⲚⲈ)ⲠⲰⲢ	house	(–)
pḥ.wï ~ *pḥ.wï*	57, 64, 161, 204, 311	ⲠⲀϨⲞⲨ	end	(+)
pḏ.t	63, 105, 127	ⲠⲒⲦⲈ	bow	(+)
mỉ	160	ⲀⲘⲞⲨ	come! (imperative)	?
m-ʿ-	240, 269	ⲚⲦⲀ-Ϥ	with	+
m w	27, 75, 82, 96, 233	ⲘⲞⲞⲨ	water	(+)
m*w*t	203, 256	ⲘⲞⲨ	death	(+)
*m*ꜣḫ	131	ⲘⲈϨ (boh.)	to burn (stative)	?
*m*ꜣʿ.t	267, 268	ⲘⲈ	truth	?
*m*n	138	ⲘⲎⲚ	to remain (stative)	(–)
*m*nỉ	310	ⲘⲞⲞⲚⲈ	to land	(–)
mnw	209	in the place name (Ϣ)ⲘⲒⲚ	Min (god)	(+)
*m*ntw	206, 238	in the place name (Ⲣ)ⲘⲞⲚⲦ *et var.* (see Timm 1984/92: I, 152)	Month (god)	(+)
*m*rḥ.t	295	ⲀⲘⲢⲎϨⲈ	oil	+
*m*ḥy.t	276	ˡⲘϨⲎ	wind	?
*m*s.w	172, 176, 186f., 197, 239, 250, 264, 266 etc.	ˡⲘⲤⲎⲨ	children	–
*m*šʿ	101	ⲘⲎⲎϢⲈ ?m	troops (coll.)	(+)
*m*d.t	2	ⲘⲞⲨⲦⲈ	speak	(+)
*m*ḏ*w*	248 bis	ⲘⲎⲦ	ten	(+)
n-	27, 31, 34, 45, 46, 51 etc.	ⲚⲀ-Ϥ	to ...	+
*n*ʾ.t	66, 171	ⲚⲎ	city	?
n-wn	197	ⲘⲘⲞⲚ	there is not	+
nb	48, 206 bis, 207, 214 bis, 238, 261 etc.	ⲚⲎⲂ (boh.)	lord	(–)
nb	193, 270, 307	ⲚⲞⲨⲂ	gold	(–)
*n*fr ~ *nfr*	75, 81, 160, 205, 206	ⲚⲞⲨϤⲈ	good	(+)
*n*fr.t	270, 275	ⲚⲞϤⲢⲈ	good (feminine)	(+)
nnw	209	ⲚⲞⲨⲚ	primordial water	+
nh.t	8, 180, 204, 264	ⲚⲞⲨϨⲈ	sycomore	+
nhm	201	ˢⲖϨⲎⲘ, ᵇⲈⲖϨⲈⲘ	to jubilate	?
nḥb.t	138	ⲚⲀϨⲂ	neck	+
nḥḥ	171, 173, 180, 212	in (Ⲉ)ⲚⲈϨ	eternity	?
ntf	39?, 50, 185?, 255?, 267 bis	ⲚⲦⲞϤ	he	+
ntk	232	ⲚⲦⲞⲔ	you	+
nṯr	43, 44, 47, 67, 70, 126, 148, 161 etc.	ⲚⲞⲨⲦⲈ	god	(+)
nṯr.w	156, 210	ⲈⲚⲦⲎⲢ	gods (pl.)	(+)
rʾ	31, 41, 195, 196, 217, 228, 272	ⲢⲞ	mouth, door	?
rʾ-*w*ꜣ.t	11	ⲢⲀⲨⲎ	road	?

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rꜥ ~ *rꜥ*	36, 179 bis, 206, 207, 210, 216 etc.	ⲣⲏ	sun	?
r-	85, 101, 120, 134, 145 bis, 163 etc.	ⲉ-ⲣⲟ-ϥ	to ...	+
rn	41, 74, 81, 227, 246, 260	ⲣⲁⲛ	name	+
rnp.t	30, 45	ⲣⲟⲙⲡⲉ	year	(+)
rnp.t	92, 100, 290	ⲣⲙⲡⲟⲟⲩⲉ	years (pl.)	?
m rḫ-	42, 114, 224	ⲙⲉϣⲁ-ϥ	do not know	+
rsw.t	225	ⲣⲁⲥⲟⲩ	dream	+
rḏ.t	4, 15, 86, 107, 158, 176, 181 etc.	ϯ	to give	(–)
hꜣ.w	168	ϩⲏⲩ	to descend (stat.)	?
hꜣw	8, 56, 150	ϩⲏ (boh.) ?	proximity	?
hrw ~ *hrw*	10, 19, 88, 190, 192, 238, 298 etc.	ϩⲟⲟⲩ	day	?
ḥꜣ.t	48, 78, 107, 180, 194, 311	ϩⲏ	front, beginning	?
ḥꜣ.tï	39, 131, 255	ϩⲏⲧ	heart	?
ḥꜥ-	24, 168, 204, 228, 255, 290	ϩⲱⲱ-ϥ	body	?
ḥw.t ~ ḥ*w*.t ~ *ḥw*.t	72, 112, 198f.	ϩⲓⲟⲩⲉ	to strike	+
*ḥw.t-ḥ*r	207, 237	ϩⲁⲑⲱⲣ	Hathor (goddess)	(–)
ḥbs.w	288, 292	ϩⲃⲱⲱⲥ	garments	+
ḥm.t	264	ϩⲓⲙⲉ	wife	(+)
ḥm.t	67, 132	ϩⲓⲟⲙⲉ	women (pl.)	(–)
ḥmw.w	296	ϩⲙⲏⲩ ~ ϩⲙⲉⲩ	craftsmen (pl.)	?
ḥr	[41], 55, 60, 278f.	ϩⲟ	face	(+)
ḥr	179, 207, 208, 209, 210, 217, 237, 242 etc.	ϩⲱⲣ	Horus (god)	(–)
ḥs.t	310	^{f}ϩⲏⲥⲉ	favor	(+)
ḥqr	151	ϩⲕⲟ	hunger	?
ḥtp	205	ϩⲱⲧⲡ	peace	+
ḥtp	148	ϩⲱⲧⲡ	to be merciful	+
ḥtp	163	ϩⲟⲧⲡ	to be merciful (stative)	–
ḥḏ	196	ϩⲁⲧ ?m	white	(+)
ḥḏ	288	ϩⲁⲧ	silver	(+)
ḫpr	51	ϣⲟⲟⲡ	to happen (stative)	(–)
ḫpr.t	35	ϣⲡⲏⲣⲉ ?m	event	(+)
ḫpš	52, 105	ϣⲱⲡϣ	arm	+
ḫrw ~ *ḫrw*	[1], 24, 173	ϩⲣⲟⲟⲩ	voice	(+)
ḫrp	229	ϣⲱⲣⲡ	to lead	+
ḫḫ	22	^{b}ϧⲁϧ	throat	+
ḫsf ~ *ḫsf*	17, 98	^{s}ⲥⲱϣϥ ~ ^{a}ϩⲱⲥϥ	to repel	+
ḫt	241, 295, 297	ϣⲉ	tree	(+)
ḫd	16	ϩⲏⲧ ?m	north	(–)
ẖ.t	39, 200, 253, 255, 262	ϩⲏ	belly	–
ẖn	137	ϩⲱⲛ	to get close	(–)
*ẖ*nw ~ *ẖnw*	6, 36, 94, 150, 157, 188, 204, 232 etc.	ϩⲟⲩⲛ ?	residence	(+)
*ẖ*nw	50, 283	ϩⲟⲩⲛ	interior	(+)
ẖr-	174	ϩⲁⲣⲟ-ϥ ?m	under	(+)
*ẖ*r.t	305	ϩⲣⲉ	need	+
ẖrd.w	167	^{b}ϧⲣⲟϯ	children (pl.)	–
*ẖ*r.t	88	ϩⲣⲉ ?m	provision	(+)
zꜣtw	200f., 302	ⲉⲥⲏⲧ	ground	?

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zp	160, 298f.	ⲤⲞⲠ	case, time	+
zḫ	302, 311	ⲤϨⲀⲒ ?	text; to write	?
sꜣ	7, 57, 58, 116, 124, 160, 227, 230, 239 etc.	ⲤⲞⲒ	back	(+)
sꜣsꜣ	57	ⲤⲰⲤ ?	attack	?
swḥ.t	68	ⲤⲞⲞⲨϨⲈ	egg	+
s m w	102	ⲤⲒⲘ ?m	pasture (coll.)	(+)
sft	191	ⲤⲒϤⲈ	cedar oil	+
sḫ.t	10	ⲤⲰϢⲈ	field	(+)
sḫr	217	ʰϢⲒϢⲒ	plan	+
sšr-nzw	288	ϢⲚⲤ	royal linen	?
stꜣ ~ *stꜣ*	230, 249	ⲤⲰⲦ	to pull	+
sdꜣ	2	ⲤⲀⲦⲈ	to tremble	–
šꜥ	73, 292, 294	ϢⲰ	sand	?
šm.t	6, 19, 249	ϢⲈ	to go	?
š*m*s	170	ϢⲘϢⲈ	to follow	(–)
šnḏw.t	308	ϢⲚⲦⲰ	loincloth	(+)
qrs	191	ⲔⲰⲰⲤ	to bury	?
qd	297	ⲔⲰⲦ	to build	(–)
*q*d	32	ϬⲞⲦ ?	quality	(+)
kꜣ	173, 179, 206, 305	in ⲔⲞⲒ(ⲀϨⲔ)	(part of the human personality)	+
ky	48, 119, 133	ϬⲈ	another (masc.)	?
*k*m.t ~ *km*.t	26, 32, 34, 76, 165, 178, 188	ⲔⲎⲘⲈ	Egypt	(+)
gr	259	ϬⲰ	to be silent	–
gs	30	ϬⲞⲤ	half	(+)
tꜣ	20, 43, 70, 81, 129, 152, 159, 164 etc.	ⲦⲞ	land	?
tꜣš	80	ⲦⲞϢ	border	?
tꜣš.w	71	ⲦⲞⲞϢ ~ ⲦⲰϢ	borders (pl.)	?
twt	307	ⲦⲞⲨⲰⲦ	statue	–
tp*ï*	307	ⲦⲠⲈ	excellent	?
tr	12, 20	ⲦⲈ ~ ⲦⲎ	time	?
*ṯꜣ*w	234, 236, 275	ⲦⲎⲨ	air	?
*ṯꜣ*z.w	100, 242	ϪⲞⲈⲒⲤ	commander	(+)
ṯz.t	23	ϪⲒⲤⲈ	to raise	+
dwꜣw	248	(Ϩ)ⲦⲞⲞⲨⲈ	morning	(+)
dp.t	23	ϮⲠⲈ	taste	+
d*m*j	12, 247, 306	ϮⲘⲈ	village	(+)
dqr	83, 241	ϮϬⲈ	fruit (coll.)	+
ḏw	15, 122	ⲦⲞⲞⲨ	mountain	(+)
r *ḏ*r(-)	111	ⲦⲎⲢ-Ϥ	all	+
ḏd	202, 215	ϪⲰ	to say	?

Total:

+	(+)	?	(–)	–
41	47	65	21	9

The result is that a clear majority of the examples agree with the syllable structure rules. Some of those examples which appear to violate the rules become explicable if writings from other texts are adduced (e.g. *twt* "statue" can also be written *twtw* which conforms to the rule). Here we can assume defective writings (☞ § 2.6.4) in the Sinuhe text. However some cases remain in which no explanation is obvious. For further discussion ☞ § 4.8.6.

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Appendix 5 Semitic loan words from the New Kingdom still found in Coptic

From the vast number of Semitic loan words used in Egyptian during the New Kingdom, only a small part survived until Coptic. However, these words are of special value for reconstructing the sound developments which Egyptian experienced during the period between the New Kingdom and the Coptic era, since their Semitic affiliation allows for more insight into their original pronunciation, especially with regard to the vowels, than what we know of most native Egyptian words.

The following chart contains all of these words I consider certain examples. There are many more words in which there is some uncertainty regarding either their Semitic affiliation or their (presumed) cognates in Coptic. All of the following words are first attested in the New Kingdom (18th - 20th Dynasties), which more or less excludes the possibility that they are emprunts into Semitic. Most of them are recorded in group writing (☞ § 5.4.2) which is likewise an indicator of their foreign origin.

meaning in Late Eg.	Coptic	Late Egyptian	Semitic cognates	references
lentils	^{s,b}ⲁⲣϣⲓⲛ /ar'ʃin/	*ʿršn*	Hebrew עֲדָשִׁים	Hoch (1994: no. 84)
wagon	^{s}ⲁϭⲟⲗⲧⲉ /a'kʲɔltə/, ^{b}ⲁϭⲟⲗϯ~ⲁϫⲟⲗϯ	*ʿgrt*	Hebrew עֲגָלָה, Syriac *ʿagaltā*	Hoch (1994: no. 100)
out-side	^{s,b}ⲃⲟⲗ /'βɔl/	*bnr* ~ *br* (‹nr› = /l/)	Hebrew בַּר "out-side", Arabic بَرّ *barr-* "open country"	Hoch (1994: no. 119)
char-iot	^{s}ⲃⲣϭⲟⲟⲩⲧ~ ⲃⲉⲣⲉϭⲱⲟⲩⲧ, ^{b}ⲃⲉⲣⲉϭⲱⲟⲩⲧⲥ	*mrkbt*	Hebrew מֶרְכָּבָה, Akkadian *narkabtu*	Hoch (1994: no. 189)
sea	^{s}ⲉⲓⲟⲙ /'jɔm/, ^{b}ⲓⲟⲙ	*ym*	Hebrew יָם, Arabic يَمّ *jamm-*	Hoch (1994: no. 52)
lion-ess	^{s,b}ⲗⲁⲃⲟⲓ /la'βɔj/	*rby*	Hebrew לָבִיא, Arabic لبوة *labwat-*	Hoch (1994: no. 273), Kammerzell (1994a: 32-34)
must	^{s}ⲙⲣⲓⲥ /m̩'ris/, ^{b}ⲉⲙⲃⲣⲓⲥ. This word occurs in modern Nubian as *merʔsa* "must, beer".	*mrs*	Syriac *merʔṯā* , Ugaritic *mrṯ*	Hoch (1994: no. 183), Khalil (1996: 72)
spear	^{s,b}ⲙⲉⲣⲉϩ /mə'reh/, ^{a}ⲙⲉⲣⲏϩ	*mrḥ*	Ugaritic *mrḥ*, Hebrew רֹמַח, Arabic رمح *rumḥ-*	Hoch (1994: no. 179)

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to rest	^{s,b}ⲙ̄ⲧⲟⲛ /m̩'tɔn/	*mdn*	Aramaic √*mtn* "immobile, slow"[415]	Yeivin (1936: 71f.)[416]
tower	^{s}ⲙⲉϭⲧⲱⲗ /məkʲ'tol/	*mktr* ~ *mgdr*	Hebrew מִגְדָּל	Hoch (1994: no. 224)
beans	^{b}ⲫⲉⲗ /'pʰɛl/	*pr*	Hebrew פּוֹל, Arabic فول *fūl-*	Hoch (1994: no. 150)[417]
to stretch	^{s}ⲡⲱⲣϣ /'porʃ/, ^{b}ⲫⲱⲣϣ, ^{a}ⲡⲱⲣϩ	*prḫ* "to blossom, sprout" > Demotic *prḫ* "to spread" (Posener 1985: 44)	Hebrew פָּרַח, Arabic فرّخ *farraḫa* "to sprout"	Hoch (1994: no. 151)[418]
cauldron	^{s}ⲣⲟϩⲧⲉ /'rɔhtə/, ^{f}ⲗⲁϩϯ	*rhd.t* (a vessel)	Akkadian *râṭu* (a vessel for water), Hebrew רְהָטִים "watering troughs"	Hoch (1994: no. 279)
wool	^{s,b}ⲥⲟⲣⲧ /'sɔrt/	*sʿrt*	Ugaritic *šʿrt* (in cuneiform transcription $^{\text{túg}}$*ša-ḫar-tu*) "wool", Hebrew שַׂעֲרָה "hair"	Hoch (1994: no. 359)
hill, mound	^{s}ⲧⲁⲗ /'tal/, ^{b}ⲑⲁⲗ	*tnr* ~ *tr* (‹nr› = /l/)	Hebrew תֵּל, Arabic تلّ *tall-*, Akkadian *tillu*	Hoch (1994: no. 527)
oven	^{s}ⲧⲣⲓⲣ /'trir/, ^{b}ⲑⲣⲓⲣ	*trr*	Hebrew תַּנּוּר	Hoch (1994: no. 531), Greppin (1993)
rod	^{s,b}ϣⲃⲱⲧ /'ʃβot/	*šbd*	Hebrew שֵׁבֶט	Hoch (1994: no. 397), cf. Quack (1996: 511)

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[415] E.g. מתן "to wait", מתין "careful, slow" in Byzantine Jewish Palestinian Aramaic (Sokoloff 1990: 336f.). While this root is not attested in Biblical Hebrew, we have מִתֵּן *miten* "to slow down" and המתין *himtin* "to wait" in Modern Hebrew which are likely to be borrowings from Aramaic. Probably the same root appears in Arabic as متن *matuna* "to be firm" with semantic change.

[416] Yeivin hesitatingly considers the possibility that the Egyptian word, which is first attested in Late Egyptian, may be borrowed from Semitic. This idea has not gained acceptance because the word is not found in group writing in Late Egyptian. Nevertheless, I consider this etymology very probable since it is straightforward both semantically and phonologically.

[417] Cf. Osing (1976a: note 60 on p. 380-382), who, based on the traditional conceptions about Coptic vowel quantity, cannot accept a direct derivation of ⲫⲉⲗ from **pūl-* and suggests a more complicated development.

[418] Hoch derives the Coptic verb from another Semitic root √*prś*, which does not agree phonetically with the Akmimic dialect form. √*prś* is rather the source of Coptic ^{l}ⲡⲱⲣⲥ "to extend", see Osing (1976a: note 967 on p. 780) and Vycichl (1983: 164).

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shame	^{s,b}ϣⲗⲟϥ /ˈʃlɔf/	*ḫnrf* (‹nr› = /l/) “reproach”	Hebrew חרף “to reproach”	Hoch (1994: no. 340)
price	^{s}ϣⲁⲁⲣ /ˈʃaːr/, ^{f}ϣⲉⲉⲣ	*šʿr*	Arabic سعر *siʿr* -	The Late Egyptian word was discovered independently by Janssen (1993: 86) and Hoch (1994: no. 389), both of whom propose the Semitic etymology.
dust	^{s}ϣϩⲓϭ /ˈʃhikʲ/, ^{b}ϣϩⲓϫ	*šḥq*	Hebrew שַׁחַק	Hoch (1994: no. 411)
dung	^{s}ϩⲟⲉⲓⲣⲉ /ˈhɔjrə/, ^{b}ϩⲱⲓⲣⲓ	*ḥry*	Hebrew חֲרָא “excrement”, Syriac *ḥeryā* “excrement”	Hoch (1994: no. 323)
to be hoarse	^{s}ϩⲱⲗ /ˈhol/, ^{b}ϧⲱⲗ	*ḫnr*	Hebrew חרר (*nifʿal*-form), Gəʿəz √*ḫrr*	Hoch (1994: no. 338)
coat of mail	^{b}ϧⲉⲗⲓⲃϣ /xəˈliβʃ/, ^{l}ϩⲁⲗⲃϣⲉ	*rbyš* “coat of armour” > Demotic *ḫ-lybš* “coat of armour” (Erichsen 1954: 262)	Hebrew לְבוּשׁ “garment”	Hoch (1994: no. 274)
vinegar	^{s}ϩⲙϫ /ˈhm̩c/, ^{b}ϩⲉⲙϫ	*ḥmḏ*	Hebrew חֹמֶץ	Hoch (1994: no. 316)
olives	^{s}ϫⲟⲉⲓⲧ /ˈcɔjt/, ^{b}ϫⲱⲓⲧ	*ḏt*	Hebrew זַיִת “olive”, Arabic زيت *zayt*- “olive oil”	Hoch (1994: no. 594)
apple	^{s}ϫⲙⲡⲉϩ /cm̩ˈpeh/, ^{b}ϫⲉⲙⲫⲉϩ, ^{a}ϫⲙⲡⲏϩ	*dpḥ* ~ *ḏpḥ*	Hebrew תַּפּוּחַ, Arabic تفّاح *tuffāḥ*-	Hoch (1994: no. 563)
shield	^{s}ϭⲗ /ˈkʲl̩/. Old Nubian ⲕⲁⲣ- and modern Nubian *karu* “shield” (Browne 1996: 85) are perhaps also related.	*qrʿ* > Demotic *grʿ*	Ugaritic *qlʿ* “shield”, Arabic قلع *qilʿ* “sail”	Hoch (1994: no. 432). There is no reason to doubt the identity with the Coptic word as Hoch does.

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pot	^{s,a}ϭⲁⲗⲁϩⲧ /kʲaˈlaht/, ^{f}ϭⲁⲗⲉϩⲧ	*krḥt* (a type of basket)	Hebrew קַלַּחַת "cauldron", Ugaritic *qlḫt* "pot"	Hoch (1994: no. 481)[419]
sole	^{s,b}ϭⲟⲡ /ˈkʲɔp/	*kp* "palm, sole"	Hebrew כַּף "palm, sole", Arabic كَفّ *kaff-* "palm, sole"	Hoch (1994: no. 457)
saf-flower	^{s}ϭⲟⲩϫ /ˈkʲuc/, ^{b}ϫⲟⲩϫ	*qḏ* "safflower *or similarly*"	Hebrew קוֹץ "thornbush"	Hoch (1994: no. 445), Vycichl (1983: 350)

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[419] The word is to be connected with Egyptian *qrḥ.t* "pot", attested since OK. Hoch's explanation that *qrḥ.t* was borrowed into Semitic from which the Late Egyptian/ Coptic word was borrowed again may seem complicated, but nevertheless is convincing. A direct derivation of the latter from *qrḥ.t* faces four difficulties: 1) preservation of word-final *-t*, 2) preservation of -ⲁ- in pretonic position in Coptic, 3) neither Late Egyptian *k* nor Coptic ϭ can be derived from Old Egyptian *q*, 4) group writing in the New Kingdom sources points to foreign origin. Osing (1976a: 337) derives ϭⲁⲗⲁϩⲧ from a supposed morphologically extended form **qrḥ.t.t*, leaving aside the Late Egyptian word. This does not explain our arguments no. 2), 3), and 4). Meeks (1997: 52) explains that some of the writings adduced by Hoch may actually belong to other words.

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Appendix 6 The Egyptian month names

The following set of Egyptian month names is first attested in Dynasty 19 (see BAKIR 1966: pls. 44f. and VAN WALSEM 1982). The names have survived in Coptic and are still used in the modern Coptic calendar in an Arabified form. These month names are among the few Coptic loan words which have entered the Arabic written language. The modern Egyptian newspapers indicate the current date by the Islamic, Gregorian, and Coptic calendars. Some of these month names were also borrowed into Nubian (cited from KHALIL 1996: 17, 74, 113). Furthermore, they are attested in several ancient transcriptions:

- Aramaic, mid 1st millennium BC, cited from ČERNÝ (1943: 177).
- Old South Arabic, late 1st millennium BC, for the sources ☞ § 2.9.3.
- Greek, ubiquitous in the ancient Greek documents written in Egypt.
- Gəʿəz (Ethiopian), three transcriptions of Late Coptic from the 18th century, cited from STRELCYN (1957: 9, 51-54). The recordings seem quite corrupt (or do they reflect deviant dialectal forms which are unattested elsewhere?).

no	Egyptian	Aramaic	Old South Arab.	Greek	Sahidic Coptic	Gəʿəz	modern Nubian	written Arabic	modern spoken Arabic	page of reference in HINDS & BADAWI (1986)
1	*ḏḥwtỉ*	*tḥwt*	–	θωυθ	ⲐⲞⲞⲨⲦ	tito	–	توت	*tu:t*	141
2	*pꜣ n ỉp.t*	*pʔpj*	–	φαωφι	ⲠⲀⲞⲠⲈ	tawfi, tawfe	–	بابة	*'ba:ba*	49
3	*ḥw.t-ḥr*	*ḥtḥwr*	*ḥtḥr*	αθυρ	ϨⲀⲐⲰⲢ	ater, ayäter	*adir*	هاتور	*ha'tu:r*[420]	900
4	*kꜣ ḥr kꜣ*	*kjḥk*	*kjḥk*	χοιακ	ⲔⲞⲒⲀϨⲔ	kʷəryaq, kʷəryaqer, kerqi	–	كياك	*ki'ya:k ~ ki'yahk*	772
5	*tꜣ ꜥꜣb.t*	*tʕ(w)bj*	–	τυβι	ⲦⲰⲂⲈ	ṭobi	–	طوبة	*'ṭu:ba*	549
6	*mḫr*	*mḫjr*	–	μεχειρ	ⲘϢⲒⲢ	meker, mikar	–	أمشير	*ʔam'ʃi:r*	36
7	*pꜣ n ỉmn-ḥtp.w*	*pmnḥtp*	–	φαμενωθ	ⲠⲀⲢⲘϨⲞⲦⲠ	fimos, mimnyos	–	برمهات	*baram'ha:t*	70
8	*pꜣ n rnn-wt.t*	*prmtj*	–	φαρμουθι	ⲠⲀⲢⲘⲞⲨⲦⲈ	tarmo, tärmo, tarm	–	برمودة	*bara'mu:da*	70
9	*pꜣ n ḫnsw*	*pḥns*	*pḥnśj*	παχων	ⲠⲀϢⲞⲚⲤ	ṗägʷə, ṗägʷəm, ṗägʷəme	*fagōn*	بشنس	*ba'ʃans*	78
10	*pꜣ n ỉn.t*	*pʔwnj*	–	παυνι	ⲠⲀⲰⲚⲈ	ṗəyon, ṗəyun	–	بؤونة	*ba'ʔu:na*	50
11	*ỉpỉp*	*ʔpp*	–	επιφι	ⲈⲠⲎⲠ	apif, eṗäre	–	أبيب	*ʔa'bi:b*	5
12	*msw.t rꜥ*	*mswrʕ*	–	μεσορη	ⲘⲈⲤⲞⲢⲎ	amoser, semer	*misōre ~ mosōre*	مسرى	*'misra*	822

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[420] Besides the normal pronunciation, HINDS & BADAWI (1986: 900) also cite a pronunciation with velarized *a* which is typical in contact with emphatic consonants, even though they do not note an emphatic *ṭ* in this word.

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Appendix 7 Pronunciation of H in Late Coptic

In Late Coptic, the letter H could be pronounced both /a(:)/ and /i(:)/ (☞ § 5.5.6). The following chart indicates the pronunciation of H in different words according to a number of Late Coptic sources. Unfortunately, all of these sources present the data in an imprecise and inconsistent manner.

- Severus Ibn al-Muqaffa, a Christian bishop of the 10th century AD, wrote a well-known book in the Arabic language *Tārīx baṭārikat al-kanīsah al-qibṭiyyah bi-l-ʔIskandariyyah* (*History of the patriarchs of the Coptic church in Alexandria*). This text contains quite a number of specific Coptic terms and names in Arabic transcription which were assembled by Farag (1976).
- Cramer (1961) published a manuscript of a liturgical text in the Coptic language with a secondarily added Latin transcription. She fixes the addition of the transcription to a time between 1531 and 1718AD (Cramer 1961: 79). The transcription points to a French background (‹ou› = [u], ‹ch› = [ʃ], inconsistent rendering of [h], superfluous *e*'s). A specific sign which Cramer renders as S seems to denote [h], although it is not used with consistency.
- Sobhy (1940) published a small part of a manuscript from 1722AD in which a Coptic text is found alongside with an Arabic transcription.
- Strelcyn (1957) published a (Bohairic) Coptic – Arabic – Gəʿəz glossary in which the words of all three languages are rendered in Ethiopic script. The manuscript is from approximately the early 18th century. I adopt Strelcyn's transcription of Gəʿəz. In addition to /a/, /e/, /i/, /o/, /u/, and /ə/, Gəʿəz has a central vowel phoneme halfway between /a/ and /ə/ which could be represented as /ʌ/. Strelcyn renders this phoneme as *å* in the neighborhood of *w* and as *a* elsewhere; I replace the latter symbol by *ä* which is more common among Ethiopists. Note that the phoneme /ə/ cannot be clearly written after consonants in the Gəʿəz script and has been stipulated by Strelcyn.

  Strelcyn (1957: 9, 49-51) further cites a Gəʿəz transcription of the Coptic Paternoster from the 17th century. I add words from this source to the same column in italics.
- Galtier (1906: 91-99) published a portion of a manuscript that renders a religious text in the Coptic language but in Arabic script. This manuscript may date to the 18th century (cf. KhS-Burmester 1965/66: 52). It should be noted that the Coptic forms are interpretations based on the Arabic writing alone since the manuscript does not provide a by-text in Coptic letters.
- Rochemonteix (1892) gives phonetic renderings of Biblical texts which he wrote down by dictation in Upper Egypt in the years 1876 and 1877. He uses a unique transcription which I have attempted to transform into IPA-symbols.

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- A similar text was recorded by Prince (1902: 294f.) in Aswān. It is very short, so I add it into the same column in italics, leaving Prince's transcription unchanged.
- Sobhy (1918: 52-54) published a Latin transcription of a prayer. It not stated where and how he recorded this text. I render his transcription without changes. *ou* obviously renders [u] by French orthography. In another article written in English, Sobhy gives a transliteration of the Lord's Prayer "according to the indigenous priest's pronunciation" (Sobhy 1915: 19), which he claims to have heard from informants of several parts of the country in identical form (Sobhy 1915: 15). I add words from this text to the same column in italics.
- Worrell & Vycichl (1942: 345-354) give phonetic transcriptions of several religious texts recorded by themselves in the 1930s near Luxor. Most of these texts were spoken by a peasant named Bistauros from the village iz-Zēnɪ̄ya. I render their transcription, a Semitistic transcription complemented by IPA symbols, without changes. I do not incorporate the words given in the vocabulary list (Worrell & Vycichl 315-318) which seem to have been elicited from the informants in isolation.

I give a transliteration of the sources which are written in Arabic script (Farag, Galtier, Sobhy 1940), applying the consonant symbols current among Semitists (‹š› for /ʃ/ etc.). The consonant signs ‹ʔ›, ‹y›, and ‹w› can also be interpreted as the long vowels [ā], [ɪ̄]/[ē], and [ū]/[ō] respectively. The undotted word-final form of ‹y› ى can in principle render [ā] as well although there is no proof that this possibility was utilized in our manuscripts. I italicize undotted ى as *y* in order to indicate its possible ambiguity. Word-final ‹ʔ› occasionally has no sound value at all which is due to pronunciation habits of modern Arabic. Short vowels are not regularly written in the Arabic script and I do not add them to my transcriptions. In a few cases, short [a] is indicated by a diacritic stroke ("*fatḥa*"), which I then render as 'a'. I sometimes propose a phonetic interpretation of the Arabic writing in brackets.

Bohairic writing	gloss	Farag (1976)	Cramer (1961)	Sobhy (1940)	Strelcyn (1957)	Galtier (1906)	Rochemonteix (1892) + *Prince (1902)*	Sobhy (1918) + *Sobhy (1915)*	Worrell & Vycichl (1942)
ⲁⲏⲣ	air		aSar						
ⲁⲗⲏⲑⲓⲛⲟⲥ	truthful		altinos (sic!)		alitinos				
ⲁⲗⲗⲏⲗⲟⲩⲓⲁ	halleluiah					ʔllylwyʔh	allɛlɔa (5x), allɔlia (sic!)		allɪ̄lūjɑ (2x), ɑllɪ̄lūjɑ (2x), ɑllɪ̄lūja (2x), ɑllɪ̄lūja
ⲁⲙⲉⲗⲏⲥ	negligent		amilas						
ⲁⲙⲏⲛ	amen		amin (6x)			ʔmyn [amɪ̄n]		amîn, *amîn*	ɑmɪ̄n (9x), amɪ̄n
ⲁⲛⲁⲅⲕⲏ	necessity						*änâġkɪ*		
ⲁⲛⲁⲅⲛⲱⲥⲧⲏⲥ	reader	ʔġnsṭs			ənəgʷən əstis				
ⲁⲛⲁⲙⲏⲓ	gem								ɑnɑmɑj
ⲁⲡⲟⲥⲧⲟⲗⲓⲕⲏ	apostolic		apostoliki, apostolici						

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ⲁⲣⲭⲏ	beginning		archi		arši		arʃi, *ârchɪ*		
ⲁⲣⲭⲓⲙⲁⲛⲇⲣⲓⲧⲏⲥ	(a monastic title)	ʔršymnṭr yds							
ⲁⲣⲭⲓⲧⲉⲗⲱⲛⲏⲥ	chief publican								aršidalōnɪs
ⲁⲥⲉⲃⲏⲥ	sacrilegious					ʔsʔwʔs [asāwās]		–	
ⲁⲥⲥⲏⲣ	(Jewish tribe)								aššēr
ⲁⲩⲗⲏⲟⲩ	halls								awlāw
ⲁⲩⲣⲏϫⲥ	its end		aoureks (2x)						
ⲃⲁⲣⲏⲓⲧ	goat								waraid
ⲃⲁⲥⲓⲗⲓⲧⲏⲥ	(Greek proper name)	bsylyts							
ⲃⲏⲃ	cave								bíb
ⲃⲏⲑⲁⲛⲓⲁ	Bethany (toponym)								betánja, bēt ánja, bitānɪa
ⲃⲏⲑⲗⲉⲉⲙ	Bethlehem						βɛtlaam (2x), βɛtlaam, βɛtlaʔam, betlaʔam		betla' ám, betla' am, betla' ām, batla' ám
ⲃⲏⲑⲫⲁⲅⲏ	Bethphage (toponym)								βɪtfajɪ
ⲃⲏⲣⲩⲗⲗⲟⲥ	beryl				birərlos				
ⲃⲟⲏⲑⲓⲛ	to help		ouatin (2x), ouhiti					ouoatin	
ⲃⲟⲏⲑⲟⲥ	helper								bōɪtōs
ⲅⲁⲃⲣⲓⲏⲗ	Gabriel (name)		gabrial						
ⲇⲏⲙⲓⲟⲩⲣⲅⲟⲥ	creator				dimi argos				
ⲇⲓⲕⲁⲓⲟⲥⲩⲛⲏ	justice					dykʔwsy ny			
ⲉⲃⲏⲗ	but								ewɪl
ⲉⲑⲃⲏⲧⲉⲛ	because of us		atoua dan						
ⲉⲑⲃⲏⲧⲥ	because of her			ʔtwʔds					
ⲉⲑⲃⲏⲧϥ	because of him						atβadf		atwáḍf
ⲉⲕⲕⲗⲏⲥⲓⲁ(ⲥ)	church		acicclesia, acEcclasia, ak Ecclesia, acecclasias		əklisya				eklisɪa, ɛkiklēsɪa
ⲉⲙⲙⲁⲛⲟⲩⲏⲗ	Emmanuel (name)								ammanūɪl, ammanuɪl
ⲉⲡⲏⲡ	(11th Coptic month)	ʔbyb							
ⲉⲡⲓⲃⲟⲗⲏ	assault		abiouoli						
ⲉⲣⲙⲏ	tear								árma
ⲉⲣϩⲏⲧⲥ	to begin								arhǽds
ⲉⲥⲏⲧ	ground		asat (2x), asad		əsät		a:sad		asɪd (2x)

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ⲈⲨⲀⲄⲄⲈⲖⲒⲤⲦⲎⲤ	evangelist								awaŋjalísdas
ⲈⲨⲖⲞⲄⲎⲤⲞⲚ	to praise (imperative)		ologison						
ⲈⲨⲬⲎ	prayer		ouka, aoka						
ⲎⲒ	house		ai (2x), Sai (2x)		äy		ai		āj (8x), áj (2x)
ⲎⲘⲰⲚ	our		imoun (3x), Simoun, ammoun						
ⲎⲢⲠ	wine				arəb				
ⲎⲢⲰⲆⲀⲤ	Herodes						erɔdas (3x), erodas (2x), ʔɛrodas, ʔirɔ:das, i:rodas, herɔdas		erɔ̄des, ɛrɔdas, irɔdæs
ⲐⲈⲂⲒⲎⲞⲨⲦ	to humble (stative)					tʔwywt (2x)			
ⲐⲈⲖⲎⲖ	to rejoice					tlʔl (2x), ʔtlʔl, ʔtʔlʔl			talīl (2x)
ⲐⲎ	that (fem.)								tī (4x), ti, di
ⲐⲎⲚⲞⲨ	you (pl.)								tinɔ́, tīnu, tānu
ⲐⲎⲞⲨ	wind				taw				
ⲐⲎⲢⲒⲞⲚ	beast				tiryon				
ⲒⲈⲢⲞⲨⲤⲀⲖⲎⲘ	Jerusalem	yrwšlym				ʔyrwṣʔlym [ʔīruṣālīm]	iɛrosalim, ʔeiiorosalim		jarúšalím, járusalīm, jirusalīm, jerūsalīm, jarusalīm
ⲒⲎⲤⲞⲨⲤ	Jesus		isous (10x)		isos	ʔysws (2x) [ʔīsūs]	ia:sus	isous (3x), *īsûs*	jisūs (7x), īsōs (6x), isōs (5x), īsṓs (3x), jasōs (2x), jasūs (2x), isɔ̄́s, isɔs, īsós, jīsūs, jisus, jāsūs, ejsōs
ⲒⲤⲔⲀⲢⲒⲰⲦⲎⲤ	Iscariot (epitheton of Judas)								ískarijodās
ⲒⲤⲢⲀⲎⲖ	Israel					ʔsrʔyyl [ʔisrāyīl]	israɛl (2x), ɔsrail		isra' īl, israīl
ⲒⲰⲀⲚⲚⲎⲤ	John		youannes						jo' ánnæs
ⲒⲰⲤⲎⲪ	Joseph	ywsʔb					iosab, ʔiosab, niɔsaf (sic!)		josēf
ⲔⲀⲐⲞⲖⲒⲔⲎ	universal		katoliki, catolici						
ⲔⲀⲦⲎⲬⲎⲤⲒⲤ	instruction	qʔtksys (-ʔt)							

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ⲕⲉⲭⲁⲣⲓⲧⲱⲙⲉⲛⲏ	favored		kakaritoumani						
ⲕⲏⲛ	to stop		kan	kyn					
ⲕⲗⲏⲣⲟⲥ	allotment		eklirous						
ⲕⲩⲣⲓⲁⲕⲏ	sunday				kiriaki				
ⲗⲉⲩⲓⲧⲏⲥ	Levite						lauidas		
ⲗⲏⲗⲟⲩⲓ	jubilation								līlūwi
ⲗⲩⲡⲏ	grief		libi						
ⲙⲁⲑⲏⲧⲏⲥ	disciple		matidas		matedas				matidás (2x), matīdās (2x), matidās, matidǣs, matīdas
ⲙⲁⲓⲏ	stature								majæ
ⲙⲁⲣⲅⲁⲣⲓⲧⲏⲥ	pearl				märgaridäs				
ⲙⲏ	not		ma						mē
ⲙⲏⲓ	truth		mai, mei	mʔy	may	mʔy	mai (3x)		
ⲙⲏⲓⲛⲓ	sign								māni, majni
ⲙⲏⲓⲥ	give her (imperative)		mahis, mais, maSis					māïs	
ⲙⲏⲓϥ	give him (imperative)				*maraf* (sic!)	mayf		*maif*	
ⲙⲏⲣ	to bind (stative)								mīr (2x)
ⲙⲏⲧⲓ	mid				mədi				mædi, mādi
ⲙⲏⲧⲣⲟⲡⲟⲗⲓⲧⲏⲥ	(title of a bishop)				mätrobolipäs (sic!)				
ⲙⲏϣ	many		mach (4x)						maš (2x), mǣš (2x), māš, mæš, mǽš, meš, mīš, mī́š
ⲙⲟⲛⲁⲥⲧⲏⲣⲓⲟⲛ	monastery		monosdirioun, bounasdirioun						
ⲙⲟⲛⲟⲅⲉⲛⲏⲥ	only-begotten		monoganis (2x), mounouganis, monosgenes (sic!)				monoɟanis	monoganis	monoɟanīs
ⲙⲟⲛⲏⲥ	sole (Greek genitive case)		mounis						
ⲙⲱⲩⲥⲏⲥ	Moses	mwysys		mwysʔs		mwsʔs [mūsās]			
ⲛⲁⲏⲧ	merciful		nahat		naat	nʔʔʔt (نا آت) [nāʔat]		naād	
ⲛⲏ	those		ni (24x), ne (2x), nSi, nou (sic!)		*ni*	nγ (4x), ny [nī]	na (2x), nei	ni (4x), *ni* (2x)	nī (11x), ni (5x)
ⲛⲏⲃ	lord		nab (4x)					nab	
ⲛⲏⲓ	to me		nai			nʔγ (3x)			naj, nāj
ⲛⲏⲥⲟⲥ	island								nīsōs

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ⲚⲎⲞⲨ	to come (stative)		naou (2x)				naɔ		nēw (2x), nɛw (2x), nɛ̄u, naw
ⲚϨⲎⲦ	in me					ʔnxʔt			
ⲚϨⲎⲦⲈⲚ	in us						ɛnkada:n		ɛnḫādā́n
ⲚϨⲎⲦⲤ	in her			ʔnxʔdy (sic!)					ɛnḫæds
ⲚϨⲎⲦⲞⲨ	in them								ɛnḫiḍú
ⲚϨⲎⲦϤ	in him		ankatf	ʔn xʔdf			ɛnxatf, *nɪḫádäf*		ɛnḫáḍf, ɛnḫædf, ɛnḫǽdf, ɛnḫædf, ɛnḫíḍf
ⲚϨⲎϮ	in you (fem.)						ɛnxa:δi		ɛnḫadi, ɛnḫadi
ⲞⲒⲔⲞⲨⲘⲈⲚⲎ	oecumene		oicomeini, oikomani						
ⲞⲨⲂⲎⲔ	against you		ouak						
ⲞⲨⲂⲎⲚ	against us		ouan						
ⲞⲨⲎⲂ	priest		ouab (2x)				ua:b		
ⲠⲀⲢⲀⲔⲖⲎⲦⲞⲚ	helping	bʔrqlyṭ	barakliton		bäraqliṭon				bɑrɑklidón, bɑrɑklīdṓn
ⲠⲀⲢⲢⲎⲤⲒⲀ	frankness								bɑrrɪsʄjɑ
ⲠⲀⲦⲢⲒⲀⲢⲬⲎⲤ	patriarch		badriercheis patriarchas		bäräaräš so (sic!)				
ⲠⲈⲚⲦⲈⲔⲞⲤⲦⲎ	Pentecost				bänitikosta				
ⲠⲒⲤⲦⲒⲔⲎ	liquid								bisdīkɑ
ⲠⲢⲞⲤⲈⲨⲬⲎ	prayer		bros ouka, brousaoyka, bros aouchi						
ⲠⲢⲞⲤⲔⲨⲚⲎⲤⲒⲤ	adoration		brouskinisis (2x), broskinisis, obroskinisis					ebroskinisis	
ⲠⲢⲞⲪⲎⲦⲎⲤ	prophet		broufidas, abroufidas		əbrofādis		brofidas (2x), ɛbrofidas, brɔfidas		brófidɑs, æbrōfīdās
ⲠⲨⲖⲎ	gate								bīli
ⲢⲀⲬⲎⲖ	Rachel (name)						ra:xal		
ⲢⲎ	sun				re	rʔ [rā]	ra		
ⲢⲎⲄⲒⲞⲚ	Region (toponym)								rɑɟijōn
ⲢⲎⲤⲒ	dust				räysi				
ⲢⲎϮ	manner		radi (2x)		*radi*	rʔdy , rʔdy [rādɪ]	ra:dɛ, ra:di	*râdi* (2x)	rādi (5x), rɑdi
ⲢⲞⲨⲂⲎⲚ	Ruben (Jewish tribe)								rubīn
ⲤⲈⲨⲎⲢⲞⲤ	(Latin-Greek proper name)	swyrs							

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ⲤⲎⲞⲨ	time		saou (7x), saSou, saouo, so			sʔw [sāw]	siiɔ (2x)	si-ou	sɑ̄w (2x), sɑ́w, saw
ⲤⲎϤⲒ	sword		safi						
ⲤⲖⲎ	bier								islæ
ⲤⲘⲎ	voice		Esma				ismɛ		ɛsmɛ́, ísmæ, ísmɛ
ⲤⲚⲎⲞⲨ	brothers		Esnaou, asnaou, esnaou						
ⲤⲞⲨⲂⲎⲦ	circumcised (stative)				sowit				
ⲤⲦⲀⲐⲎⲦⲈ	arise! (imperat. plural, Greek)		statide, estadide, Ekatide (sic!)						
ⲤⲰⲦⲎⲢ	savior		soutir (5x), soudir		säter	ṣwtyr			sodɪr (2x), sōdɪr
ⲤⲰⲦⲎⲢⲒⲀ	preservation		soudaria, soudiria			swtʔryʔʔ (سوتارياء)			
ⲤⲬⲎⲘⲀ	form	ʔskym [ʔiskīm]							
ⲤϨⲎⲞⲨⲦ	to write (stative)						esxaud		sḫɑwd
ⲦⲀⲒⲎⲞⲨⲦ	to glorify (stative)		daihiout, daiout, daSiout						dɑjɑwt
ⲦⲀⲨⲦⲎⲤ	(Greek demonstrative)		daudis (2x)						
ⲦⲈⲚⲚⲎⲞⲨⲦ	to oppress (stative)					dʔnwt [dānnawt], dnwt [dannawt]			
ⲦⲎⲂ	finger				däb				
ⲦⲎⲒⲤ	to give her								dɑjs
ⲦⲎⲒⲦⲞⲨ	to give them								ḍɑjḍu
ⲦⲎⲒϤ	to give it						daif		dɑ́jf (2x), ḍɑ́jf (2x), ḍɑjf (2x)
ⲦⲎⲢⲈⲚ	all of us		daran (3x), dharan, deSeren				da:ra:n		dɑ̄rɑ́n
ⲦⲎⲢⲤ	all of her		dars (4x), deres				dars	dars	dɑrs
ⲦⲎⲢⲞⲨ	all of them		darou (13x), daSrou, dSarou, derou	dʔrw [dārū]		dʔrwʔ (3x)[421], dʔrw (2x) [dārū]	darɔ (3x), da:rɔ (2x), daru	darou (2x), dārou	dɑ̄ru, dɑ̄row, ḍæru
ⲦⲎⲢϤ	all of him		darf, tarf					darf	dǽrf

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[421] Written twice داروء and once داروا.

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ⲦⲎⲤ	(Greek definite article)		dis (3x), das						
ⲦⲞⲨⲂⲎⲞⲨⲦ	to cleanse (stative)		douoS ot (sic!)						
ⲞⲨⲎⲒ	forsooth								waj, waj
ⲪⲎ	that		bi (10x)	by [bɪ]			bi (6x), *vī*		bi (12x), bɪ (8x), b̮i (5x), baj
ⲪⲎⲚ	to pour (stative)		fin						
ⲪⲎⲞⲨⲒ	heavens		faoyi, faouy		*fawi*	fʔwy (6x) [fāwɪ]	faui (4x)	*fāūi*	bawi
ⲪⲨⲖⲎ	tribe								fɪla, fɪlɛ
ⲬⲀⲖⲔⲎⲆⲰⲚ	chalcedony				kärkidon				karkɪdōn
ⲬⲎ	to lie (stative)						ka (5x), *kā́* (2x)		ke (21x), ké (4x), kɛ (2x), kæ (2x), ké, kē
ⲬⲎⲘⲒ	Egypt						ka:mi (3x), kami		
ⲬⲎⲢⲀ	widow		chira (2x)						šɪra
ⲬⲖⲞⲎ	young plant		ekloui						
ⲬⲢⲎⲤⲦⲞⲤ	good								eḫrisós
ⲮⲀⲖⲦⲎⲢⲒⲞⲚ	harp								bsaltɪrijōn
ⲮⲀⲖⲦⲎⲤ	harper		apsaldas						
ⲮⲨⲬⲎ	spirit		Epsika, Ebsika, epsica				psi:ka		ebsɪka
ⲰⲢⲒⲄⲈⲚⲎⲤ	(Greek proper name)	ʔwrğʔnʔs							
ϢⲎⲔ	to be deep (stative)					šʔk [šāk]			
ϢⲎⲢⲒ	son		chiri (8x)	šyry	šäri	šyry (3x), šyry [šɪrɪ]	ʃiri (2x), ʃi:ri	shiri	šɪri (17x), šíri
ϢⲖⲎⲖ	to pray		Echlal (2x), Echelal, chelal		šlil				
ϢⲞⲨⲢⲎ	incensor				šura				
ϢⲪⲎⲢ	friend								išbɪr, isbɪr
ϢⲪⲎⲢⲒ	wonder								išbāri, išb̮āri
ϢϢⲎⲚ	tree		Ecchen (2x)						
ϪⲎⲂⲤ	lamp				žabəsa				
ϪⲢⲎⲒ	down						ɛxrai, ʔexrai		eḫrai, eḫrāj, eḫraj, eḫrāj
ϨⲂⲎⲞⲨⲒ	things								ehwāwi
ϨⲎ	front		Sa				ha, *hā*		hā
ϨⲎⲂⲒ	grief								hāwi

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ϨⲎⲄⲈⲘⲞ-ⲚⲒⲔⲞⲚ	authoritative					hayġʔmw nykwn[422]			
ϨⲎⲄⲈⲘⲰⲚ	ruler						ejamɔn, ɛgamɔn		hajamón
ϨⲎⲄⲞⲨ-ⲘⲈⲚⲞⲤ	president	ʔġwmns	SiSoumanous, sikoumanous (sic!)						hiġomanós
ϨⲎⲔⲒ	poor		aki						hīki
ϨⲎⲖ	to hurry (stative)								hīl
ϨⲎⲘⲈⲢⲀ	day				amәru				
ϨⲎⲠ	to hide (stative)		hab			hʔb [hāb]		hab	
ϨⲎⲠⲠⲈ	behold					hbʔ (2x)	habba 3x, hibba: 1x		hābbe, abba, hábba, habba
ϨⲎⲦ	heart		at (6x), had, Sat, nat (sic!)		hät, hat, ha[423]	hʔt (2x) [hāt], hʔd [hād]		hid	hīd (8x)
ϨⲒⲢⲎⲚⲎ(Ⲥ)	peace		irini (3x), Erine (2x), Sirini (2x), hirini, irinis					hirîni, hirini	hirīni (8x)
ϨⲒⲢⲎⲚⲒⲔⲞⲚ	peaceful		irinikoun, Sirinikon, Sirinikoun						
ϨⲢⲎⲒ	up		Serai (2x), Sarai, Sirai, Sirey, Sairei, Skrai, crei, irey, Erei			hrʔy (2x)		hrai	hrāj (3x), hráj, hrā́j
ϨⲦⲎϤ	his heart		Setafe						
ϨⲰⲆⲎ	song					hwdʔ			
ϪⲎⲔ	to finish (stative)								ȷæk
ϪⲀϬⲎ	left side				žäšä				
ϬⲎ	quince				ša				
ϬⲎⲠⲒ	cloud				šäbe				
ϬⲒⲎ	boundary						ʃiʔi		
ϬⲖⲎ	scorpion		chla, chle					etšla	

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[422] Written as three words: انمَن جامونى كون (Ⲛ-ϨⲎⲄⲈⲘⲞⲚⲒⲔⲞⲚ). Unfortunately, this writing leaves three possibilities for the pronunciation of Ⲏ: [ā], [ay], [ē].

[423] *hat* as a part of the compound ⲘⲈⲤⲦⲈⲚ-ϨⲎⲦ *mäsdәnhat* "breast", *ha* as a part of the compound ⲢⲈϤ-ϢⲈⲚ-ϨⲎⲦ *rafšänha* "pitiful" instead of which Strelcyn (1957: 35) probably wrongly assumes ⲢⲈϤϢⲞⲚⲒ.

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Appendix 8 Representation of Coptic consonants in Arabic loan words

Several Coptic words were borrowed into the modern Egyptian Arabic dialect. In the following, I give one example each of all sound correspondences between Coptic and Arabic consonants which are reasonably well attested. I have chosen a standardized transcription for certain Arabic phonemes which have a varying pronunciation throughout Egypt: I write /ǧ/ for the sounds that in native words would be derived from Classical Arabic ج (= [ɟ] in several areas, [d] in some regions of Upper Egypt, [g] in Cairo and adjacent areas)[424], /q/ for the sounds that in native words would be derived from Classical Arabic ق /q/ (= [g] most widespread, especially in the south, [ʔ] in Cairo and adjacent areas), /ē/ and /ō/ for what would be the outcomes of the Classical Arabic diphthongs /ay/ and /aw/ respectively (several pronunciation variants throughout Egypt). I use /ḥ/ for /ħ/ and /š/ for /ʃ/. The dot in /ṣ/, /ḍ/, /ṭ/ indicates emphatics.

Wherever possible, the Arabic form is given according to the dictionary of Hinds & Badawi (1986) which is based on the Cairene standard, or according the collection of dialect materials by Behnstedt (1981). Since Hinds & Badawi (1986) are not concerned with Coptic etymologies, I cite Vittmann (1991) for the proposed connection to Coptic. If the word is not found in the sources mentioned, I refer to the older collection by Bishai (1964).

Coptic nouns are frequently borrowed together with the Coptic definite article which has become morphologically opaque in Arabic. Bohairic possesses two functionally distinct sets of definite articles – along with one indefinite article –, which are traditionally called "strong" (ⲡⲓ-, ϯ-, ⲛⲓ-) and "weak" (ⲡ-/ⲫ-, ⲧ-/ⲑ-, ⲛⲉⲛ-~ⲛⲓ-) respectively.[425] For the Bohairic equivalents cited here, I have always inserted the strong definite article although it is unclear which form was actually adopted in the process of borrowing.

Coptic	Arab.	example	bibliography
ⲃ	b	/bil'bila/ "almost any small rounded hanging object" < ^{s}ⲃⲗⲃⲓⲗⲉ "grain, fruit"	Hinds & Badawi (1986: 96), Vittmann (1991: 207)
	w	/'wirwir/ "crisp and young" < ^{s}ⲃⲣⲣⲉ, ^{b}ⲃⲉⲣⲓ "new, young"	Hinds & Badawi (1986: 934), Vittmann (1991: 216)
	f	/na:f/ "yoke" < ^{s}ⲛⲁϩⲃ, ^{b}ⲛⲁϩⲃⲉϥ "yoke"	Hinds & Badawi (1986: 843), Bishai (1964: 44)
	m	/bal'šu:m/ "heron" < ^{s}ⲡ-ⲉⲗϭⲱⲃ, ^{b}ⲡⲓ-ⲉⲗϫⲱⲃ "heron"	Bishai (1964: 40)
^{s,b}ⲡ	b	/'we:ba/ (measure equal to one-sixth of an *ardeb*) < ^{s}ⲟⲉⲓⲡⲉ, ^{b}ⲱⲓⲡⲓ (idem)	Hinds & Badawi (1986: 958), Vittmann (1991: 216)

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[424] Although this sound corresponds to Proto-Semitic /g/, the Cairene form is probably an innovation rather than an archaism, ☞ note in § 3.3.8.1.

[425] The functions of each are discussed in Depuydt (1985b).

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^{s}ⲡ, ^{b}ⲫ	b	/'birba/ “ancient temple” < ^{s}ⲡ-ⲣⲡⲉ, ^{b}ⲡⲓ-ⲉⲣⲫⲉⲓ “temple”	Hinds & Badawi (1986: 60), Vittmann (1991: 207)
	f	/faṭṭ/ “to jump, to run” < ^{s}ⲡⲱⲧ, ^{b}ⲫⲱⲧ “to run, to flee”	Hinds & Badawi (1986: 662f.), Bishai (1964: 41)
ϥ	f	/fo:da/ “Palmzweig zum Auswischen des Ofens” < ^{s}ϥⲱⲧⲉ, ^{b}ϥⲱϯ “to wipe”	Behnstedt (1981: 85) (recorded in Upper and Middle Egypt)
ⲙ	m	/'misra/ “12th month of the Coptic year” < ^{s,b}ⲙⲉⲥⲟⲣⲏ	☞ appendix 6
ⲟⲩ	w	/rif'ṭa:w/ “mesure of grain equal to one quarter of a *keela*” < ^{s}ⲣⲁϥⲧⲟⲟⲩ, ^{b}ⲣⲉⲇ̄ “a quarter”. Bohairic ⲇ̄ is the numeral “4”.	Hinds & Badawi (1986: 344), Vittmann (1991: 212)
^{s,b}ⲧ	t	/ʔam'nu:t/ “sexton” < ^{s,b}ⲙⲛⲟⲩⲧ “doorkeeper”	Bishai (1964: 40)
	ṭ	/'ṭurja/ “kind of mattock” < ^{s}ⲧⲱⲣⲉ, ^{b}ⲧⲱⲣⲓ “hand; spade”	Hinds & Badawi (1986: 539), Vittmann (1991: 215)
	d	/di'mi:ra/ ~ /di'me:ra/ “time of flood” < ^{s}ⲧ-ⲉⲙⲏⲣⲉ, ^{b}ϯ-ⲁⲙⲏⲓⲣⲓ “inundation”	Hinds & Badawi (1986: 304), Vittmann (1991: 209)
^{s,b}ⲑ	t	/ha'tu:r/ (3rd month of the Coptic year) < ^{s}ϩⲁⲑⲱⲣ, ^{b}ⲁⲑⲱⲣ	☞ appendix 6
^{s}ⲧ, ^{b}ⲑ	ṭ	/ṭa:š/ “border (especially of a field)” < ^{s}ⲧⲟϣ, ^{b}ⲑⲟϣ “border”	Bishai (1964: 46)
	d	/ħan'du:s/ “lizard” < ^{b}ⲁⲛⲑⲟⲩⲥ “lizard” (< Egypt. *ḥnts*. The word is not attested in Sahidic, we would expect *^{s}ϩⲁⲛⲧⲟⲩⲥ)	Bishai (1964: 42)
ⲥ	s	/ba'ʃans/ (9th month of the Coptic year) < ^{s,b}ⲡⲁϣⲟⲛⲥ	☞ appendix 6
	ṣ	/ṣaxṣa:xa/ “Ziehbalken zum Ebnen des Ackers” < ^{b}ⲥⲁϩⲥⲉϩ “to rub, to plain”	Behnstedt (1981: 93) (recorded in Upper Egypt)
ⲛ	n	/'šo:na/ “store place (especially for grain)” < ^{b}ϣⲉⲩⲛⲓ ”granary”	Hinds & Badawi (1986: 487), Vittmann (1991: 214)
ⲣ	r	/di'mi:ra/ ~ /di'me:ra/ “time of flood” < ^{s}ⲧ-ⲉⲙⲏⲣⲉ, ^{b}ϯ-ⲁⲙⲏⲓⲣⲓ “inundation”	Hinds & Badawi (1986: 304), Vittmann (1991: 209)
ⲗ	l	/lağğ/ “to insist, nag” < ^{s}ⲗⲁϭ, ^{b}ⲗⲁϫⲓ “impudent/ persistent person”	Hinds & Badawi (1986: 781), Bishai (1964: 43)
^{s,b}ϫ	ğ	/ğaban'jo:t/ “Pater Noster” < ^{s}ϫⲉ-ⲡⲉⲛ-ⲉⲓⲱⲧ, ^{b}ϫⲉ-ⲡⲉⲛⲓⲱⲧ “speaking: our father”	Hinds & Badawi (1986: 148), Vittmann (1991: 209)
	ṣ	/ṣi:r/ “heavily salted” < ^{s,b}ϫⲓⲣ “brine”	Hinds & Badawi (1986: 516), Vittmann (1991: 213)
^{s}ϫ, ^{b}ϭ	š	/'šu:ša/ “forelock” < ^{s}ϫ/ϭⲓϫⲱⲓ, ^{b}ϫⲓϭⲱⲓ “lock, plait of hair”	Hinds & Badawi (1986: 485), Vittmann (1991: 215)

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^{s}ϭ, ^{b}ϫ	ǧ	/laǧǧ/ “to be persistent” < ^{s}ⲗⲁϭ, ^{b}ⲗⲁϫⲓ “impudent/ persistent person”	Hinds & Badawi (1986: 781), Bishai (1964: 43)
	š	/balˈšu:m/ “heron” < ^{s}ⲡ-ⲉⲗϭⲱⲃ, ^{b}ⲡⲓ-ⲉⲗϫⲱⲃ “heron”	Bishai (1964: 40)
	ṣ	/baṣˈro:ṣ/ “oat” < ^{s}ⲡⲉ-ϭⲣⲟϭ, ^{b}ⲡⲓ-ϭ/ϫⲣⲟϫ “seed”	Behnstedt (1981: 84) (recorded in Bani Ḥasan, Middle Egypt)
^{s,b}ϭ	ǧ	/baǧuˈru:m/ “Griessäule” < ^{s}ϭⲉⲣⲱⲃ, ^{b}ϭⲁⲣⲱⲡ “stick”	Behnstedt (1981: 83) (recorded in the Fayyūm and Middle Egypt)
ϣ	š	/ʔamˈši:r/ “6th month of the Coptic year” < ^{s,b}ⲙϣⲓⲣ	☞ appendix 6
ⲉⲓ	j	/ǧabanˈjo:t/ “Pater Noster” < ^{s}ϫⲉ-ⲡⲉⲛ-ⲉⲓⲱⲧ, ^{b}ϫⲉ-ⲡⲉⲛⲓⲱⲧ “speaking: our father”	Hinds & Badawi (1986: 148), Vittmann (1991: 209)
^{s,b}ⲕ	q	/ˈqu:ṭa/ “basket” < ^{s,b}ⲕⲟⲧ “basket”	Behnstedt (1981: 87f.). This form was recorded in northern Middle Egypt. In other parts of Egypt there are forms with agglutinated Coptic article such as /baqu:ṭi/.
	ǧ	/ˈkalaǧ/ “to limp” < ^{s,b}ⲕⲱⲗϫ “to bend/ to be bent”	Bishai (1964: 43)
^{s}ⲕ, ^{b}ⲭ	k	/ˈsikka/ “plough, plowshare” < ^{s}ⲥⲕⲁⲉⲓ, ^{b}ⲥⲭⲁⲓ “to plough”	Cf. Behnstedt (1981: 91, no. 44)
^{s}ϩ, ^{b}ϧ	x	/baˈxu:m/ (proper name) < ^{s}ⲡⲁϩⲱⲙ, ^{b}ⲡⲁϧⲱⲙ (< Egyptian *pꜣ-ꜥẖm*)	Vycichl (1983: 22)
^{s,b}ϩ	h	/ˈhammas/ “to sit” < ^{s}ϩⲙⲟⲟⲥ, ^{b}ϩⲉⲙⲥⲓ (< Egyptian *ḥms.t*)	Bishai (1964: 42). On the various forms of this verb in Coptic and their use see Funk (1977: 27f.).
	ḥ	/ħinn/ “irdenes Melkschälchen” < ^{s,b}ϩⲓⲛ “vessel, cup” (< Egyptian *hnw*)	Behnstedt (1981: 84) (recorded in the Delta)
	Ø	/na:f/ “yoke” < ^{s}ⲛⲁϩⲃ, ^{b}ⲛⲁϩⲃⲉϥ “yoke”	Hinds & Badawi (1986: 843), Bishai (1964: 44)

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Appendix 9 Modern Egyptian toponyms of Pre-Arabic origin

A good number of modern Egyptian toponyms are of Pre-Arabic, i.e. Egypto-Coptic or Greek origin. The following is a list of important towns of modern Egypt bearing Pre-Arabic names. The towns are arranged from north to south. The Arabic script is transcribed by the same conventions as in appendix 8. Most Coptic name forms are taken from Timm (1984-1992).

spoken Arabic	written Arabic	Coptic	comment on the etymology
Damyāṭ	دمياط	ⲧⲁⲙⲓⲁϯ *et var.*	This name is not attested prior to Coptic. The etymology is uncertain, cf. Vycichl (1983: 215).
ʔIskandariyya	اسكندرية	–	From Greek ᾿Αλεξάνδρεια, named after Alexander the Great. The form of Classical Arabic is *al(-)iskandariyya*, but *al-* was reanalyzed as a definite article and is frequently omitted in the spoken language today. The Coptic name of the town is different (ⲣⲁⲕⲟⲧⲉ).
Damanhūr	دمنهور	ⲡⲧⲓⲙⲓⲛϩⲱⲣ *et var.*	This certainly goes back to **pꜣ-dmj-n-ḥrw*, "the town of Horus (god)". While this name does appear as a toponym in Ptolemaic Egypt (Westendorf 1965/77: 479), its identification with the actual town ⲡⲧⲓⲙⲓⲛϩⲱⲣ is uncertain.
Samannūd	سمنود	ϫⲉⲙⲛⲟⲩϯ *et var.*	*ṯb-nṯr* (since Dynasty 25), literally "... of the god", the interpretation of *ṯb* being doubtful. The ancient Greeks adopted this name as Σεβεννυτος. It appears that the Arabic form is based on this rather than on the Coptic form (thus already Worrell 1934: 74f.). The name of the surrounding nome, already attested in the Old Kingdom, is written with a logogram that is perhaps to be read *ṯb-nṯr* as well. See Montet (1957-1961, 1: 103f.).
Faqūs	فاقوس	–	Not attested in Coptic, but found as Φακουσα in Ancient Greek. I cannot propose an etymology of this name.
Minūf	منوف	ⲡⲁⲛⲟⲩϥ *et var.*	*pr-nbw*, literally "house of gold". This name is first attested in Dynasty 25 (*Piye stela* 3 = Grimal 1981: 5* and note 18 on p. 16). Identification with ⲡⲁⲛⲟⲩϥ by Daressy (1912: 200f.).
Banhā	بنها	ⲡⲁⲛⲁϩⲟ *et var.*	Not attested before Coptic. The etymology is obscure. The derivation from *pr-nh.t* cited by Czapkiewicz (1971: 44) is impossible (*nh.t* "sycamore" = Coptic ⲛⲟⲩϩⲉ).
Bilbēs	بلبيس	ⲫⲉⲗⲃⲏⲥ *et var.*	A further etymology is not known.
ʔAšmūn	اشمون	ϭⲙⲟⲩⲙⲓ	A further etymology is not known.
Qalyūb	قليوب	ⲕⲁⲗⲓⲱⲡⲉ *et var.*	From the Greek proper name Καλλιόπη. It is not uncommon for late Egyptian place names to be identical to proper names. It is to be understood "the town of ...".

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Sinnūris	سنورس	ⲡ[ⲉ]ⲯⲓ-ⲛⲉⲩⲣⲏ[ⲥ]	The town is well attested in Greek as Ψινευρης (Timm 1984-1992, 5: 2355f., cf. also Timm 1984-1992, 4: 2034). This name is probably identical to the Egyptian proper name *pꜣ-šrj-n-ḥrw* "the son of Horus (god)" (Lüddeckens & Thissen 1980ff.: 254). Coptic ⲡⲉ- seems to go back to *pr* "house", so the place name would originally mean "the house of *pꜣ-šrj-n-ḥrw*". Egyptian ‹š› in *šrj* would normally have been preserved as /ʃ/ in Arabic; the Arabic name must therefore be derived from the Greek rather than the Egyptian form (Greek had no /ʃ/).
Fayyūm	فيوم	ⲡⲓⲟⲙ, ⲫⲓⲟⲙ *et var.*	*pꜣ-ym* (since NK). *pꜣ* being the definite article, *ym* is a Late Egyptian borrowing from Semitic **yamm*- "sea", used for referring both to the Mediterranean Sea as to the Fayyūm lake (Hoch 1994: no. 52). This is the name of both an area and its principle town. The latter is called *Madīnat al-Fayyūm* today.
Biba	ببا	ⲡⲁⲡⲟ	A further etymology is not known.
ʔil-Fašn	الفشن	ⲡⲃⲏϣⲛ *et var.*	A further etymology is not known.
Samalūṭ	سمالوط	ⲧⲥⲉⲙⲟⲩ-ⲗⲟⲧ *et var.*	ⲧⲥⲉ- may be the first part of an Egyptian female proper name (*tꜣ šrj n* ... "daughter of ..."), or it may go back to Egyptian *tꜣ s.t* "the place (of...)". The rest is obscure.
ʔil-Minya	المنية	ⲧⲙⲱⲛⲏ, ⲧⲙⲟⲟⲛⲉ	Female definite article ⲧ + Greek μονή "station, apartment, monastery" (Vycichl 1983: 116).
Mallawi	ملوى	ⲙⲁⲛⲗⲁⲩ	Not attested before Coptic. ⲙⲁ-ⲛ-ⲗⲁⲁⲩ means "place of textiles" in Sahidic, which is probably the correct etymology (Crum 1939: 147a; Černý 1976: 346).
Dērūṭ	ديروط	ⲧⲉⲣⲱⲧ	A further etymology is not known.
ʔil-Quṣīya	القوصية	ⲕⲱⲥ *et var.*	*qjs* (attested since OK, see Zibelius 1978: 239f.).
Manfa-lūṭ	منفلوط	ⲙⲁⲛⲃⲁⲗⲟⲧ	The earliest Coptic attestation of this name is from as late as 1296AD (Timm 1984-1992, 4: 1558). The name is transparent in Coptic and means "place of fleeces".
ʔAbnūb	ابنوب	–	No early form of this toponym is attested, but the name does not seem to be Arabic. A possible etymology is Egyptian **pr-nbw* "house of gold" (Horn 1987: 18f.).
ʔAsyūṭ	اسيوط	ⲥⲓⲟⲟⲩⲧ *et var.*	*zꜣw.tï* (attested since OK, see Zibelius 1978: 196). The name is transcribed as *ši-ia-a-u-tú* into Neo-Assyrian cuneiform (Borger 1996: 21).
ʔAbu Tīǧ	ابوتيج	ⲁⲡⲟⲑⲏⲕⲏ *et var.*	From Greek ἀποθήκη "storehouse".
ʔAxmīm	اخمیم	ϣⲙⲓⲛ, ⲭⲙⲓⲙ	*ḫntï-mnw* (attested since NK, see Montet 1957-1961, 2: 108f.), lit. "antechamber of Min (god)".
Čirǧa	جرجا	–	Probably from Egyptian *grg.t* "settlement" (Wb 5, 188, 14-16) which is a common element of Egyptian place names (cf. Gardiner 1947: vol. 2, 44*). In Coptic, however, the word is almost extinct. See Vycichl (1983: 86).

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Balyana	بلينا	ⲦⲠⲞⲖⲨⲂⲒⲀⲚⲎ *et var.*	An adjectival derivation from the Greek proper name Πολύβιος with the Coptic definite article Ⲧ- (πόλις "town" is implied: "the town of Polybios").
Faršūṭ	فرشوط	ⲦⲂⲈⲢϢⲰⲦ, ⲂⲈⲢϬⲞⲞⲨⲦ	From Semitic *brk.t* "pond" (Hoch 1994: no. 107). This word was borrowed as *brkt* into Late Egyptian, but we do not know whether it served as a proper name for referring to this specific place prior to Coptic times.
Hiw	هو	ϨⲰ *et var.*	From *ḥw.t* "mansion", an abbreviation of earlier *ḥw.t-sḫm-ḫpr-kꜣ-rꜥ-mꜣꜥ-ḫrw* "mansion of the sistrum of Sesostris I" which is already found in the MK (Gardiner 1947: I, 13 and II, 33*f.). On the vocalization of the Arabic name see Horn (1987: note 40 on p. 8).
Dandara	دندرة	ⲚⲒⲦⲚⲦⲰⲢⲈ *et var.*	*ỉwn.t-tꜣ-nṯr.t* (since NK, Gardiner 1947: II, 30*), earlier *ỉwn.t* (since OK, Zibelius 1978: 23-26), maybe derived from *ỉwn* "pillar". The name was expanded by an allusion to Hathor, a famous goddess of this site (*ỉwn.t tꜣ nṯr.t* "*ỉwn.t* of the goddess") because by the NK the name *ỉwn.t* had become phonetically too similar to other Egyptian place names (☞ e.g. ʔArmant below).
Qina	قنا	ⲔⲞⲚⲎ *et var.*	From Greek καινὴ (πόλις), lit. "new (town)" (Gardiner 1947: I, 29*f.).
Qifṭ	قفط	ⲔⲎⲂⲦ, ⲔⲂⲦ *et var.*	*gbtw* (attested since OK, Zibelius 1978: 246-248).
Qūṣ	قوص	ⲔⲰⲤ *et var.*	*gsꜣ* (attested since OK, Zibelius 1978: 252f.).
ʔil-Uqṣur	الاقصر	ⲠⲄ̅ Ⲛ ⲔⲀⲤⲦⲢⲞⲚ	The ultimate origin of this toponym, known as "Luxor" in Europe, is the Latin noun *castrum* which by the intermediation of Greek was borrowed into both Coptic (ⲔⲀⲤⲦⲢⲞⲚ) and Arabic (*qaṣr*). It is therefore difficult to decide whether the name was coined by the Copts or by the Arabs. The Coptic name is found only in late sources and may be a translation from the Arabic (ⲠⲄ̅ Ⲛ ⲔⲀⲤⲦⲢⲞⲚ "the three edifices", ʔil-Uqṣur "the edifices"). In Pre-Arab times the site was known as ⲀⲠⲈ < Eg. *ip.t*.
ʔArmant	ارمنت	ⲢⲘⲞⲚⲦ, ⲈⲢⲘⲀⲚⲦ *et var.*	*ỉwnỉ-mnṯw* (since NK, Montet 1957-1961, 2: 72), earlier *ỉwnỉ* (since OK, see Zibelius 1978: 18f. and Saleh 1977: 24 bottom right). *ỉwnỉ* may be derived from *ỉwn* "pillar". *mnṯw* is a famous god of this site. ☞ the remark on Dandara above.
ʔIsna	اسنا	ⲤⲚⲎ *et var.*	(*tꜣ*)-*sny.t* (in the Graeco-Roman period, more doubtfully already in the MK, cf. Montet 1957-1961, 2: 47)
ʔIdfu	ادفو	ⲦⲂⲰ *et var.*	*ḏbꜣ* (attested since MK, Montet 1957-1961, 2: 31)
Kōm ʔUmbu	كوم امبو	ⲈⲘⲂⲰ	*nby.t* (attested since Dynasty 2, see Kahl 1994: 367, 691). The name is an adjectival derivation from *nbw* "gold". Kōm ʔUmbu may have been a starting point for expeditions to gold mines in the Eastern desert.
ʔAswān	اسوان	ⲤⲞⲨⲀⲚ, ⲤⲞⲨⲎⲚ *et var.*	*swnw* (attested since NK, see Montet 1957-1961, 2: 17), literally "market". This was an important trading site on Egypt's border with Nubia.

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Appendix 10 Some lexical differences between two major Coptic dialects

The dialects of Coptic seem closely related and are commonly believed to differ mainly in the fields of phonetics and writing conventions. However, a number of semantic concepts are expressed by etymologically unconnected words in different Coptic dialects. This need not mean that a word from one dialect is absolutely lacking from the others. The common scenario rather is that the standard expression of one dialect is little common in another, maybe only found in a few texts, or maybe with some different shading in meaning. The following table illustrates lexical divergences between Sahidic and Bohairic, the two best known dialects of Coptic, by some examples from the basic vocabulary. These lexical differences provide the clearest indication that Sahidic and Bohairic are indeed different varieties in a linguistic sense rather than merely different orthographical conventions for rendering a homogeneous Coptic language (on this issue ☞ § 2.3).

English	word A in Sahidic (popular)	word A in Bohairic (infrequent)	word B in Sahidic (infrequent)	word B in Bohairic (popular)
to ask	ϫⲛⲟⲩ	ϭⲛⲟⲩ	ϣⲓⲛⲉ	ϣⲓⲛⲓ
to begin	ⲁⲣⲭⲉⲓ	(not attested)	(not attested)	ⲉⲣ-ϩⲏⲧⲥ
belly	ϩⲏ	ϧⲏⲧ-	ⲛⲏϭⲉ	ⲛⲉϫⲓ
big	ⲛⲟϭ	ⲛⲟϫ	(not attested)	ⲛⲓϣϯ
to give birth	ϫⲡⲟ	ϫⲫⲟ	ⲙⲓⲥⲉ	ⲙⲓⲥⲓ
(female) breast	ⲉⲕⲓⲃⲉ	ⲕⲓϥⲓ	(not attested)	ⲙⲛⲟⲧ
child, boy	ϣⲏⲣⲉ ϣⲏⲙ	(not attested)	ⲁⲗⲟⲩ	ⲁⲗⲟⲩ
city	ⲡⲟⲗⲓⲥ	ⲡⲟⲗⲓⲥ	(not attested)	ⲃⲁⲕⲓ
to collect, to gather	ⲥⲱⲟⲩϩ	(not attested)	ⲧⲟⲟⲩⲧⲉ	ⲑⲱⲟⲩϯ
field	ⲥⲱϣⲉ	(not attested)	ⲉⲓⲱϩⲉ	ⲓⲟϩⲓ
from, since	ϫⲓⲛ	(not attested)	(not attested)	ⲓⲥϫⲉⲛ
fruit	ⲕⲁⲣⲡⲟⲥ	(not attested)	ⲟⲩⲧⲁϩ	ⲟⲩⲧⲁϩ
to go	ⲃⲱⲕ	ϥⲱⲕ	ϣⲉ	ϣⲉ
how?	ⲛⲁϣ ⲛϩⲉ	(not attested)	ⲡⲱⲥ	ⲡⲱⲥ
left (side)	ϩⲃⲟⲩⲣ	(not attested)	ϭⲁϫⲏ	ϫⲁϭⲏ
many, much	ϩⲁϩ	(not attested)	ⲙⲏⲏϣⲉ	ⲙⲏϣ
night	ⲟⲩϣⲏ	(not attested)	ϭⲱⲣϩ	ϫⲱⲣϩ
to become pregnant	ⲱⲱ	(not attested)	ⲉⲣ-ⲃⲁⲕⲉ	ⲉⲣ-ⲃⲟⲕⲓ
sea	ϩⲁⲗⲁⲥⲥⲁ	ⲑⲁⲗⲁⲥⲥⲁ[426]	ⲉⲓⲟⲙ	ⲓⲟⲙ
to send	ϫⲟⲟⲩ	ϫⲉⲩ	ⲟⲩⲱⲣⲡ	ⲟⲩⲱⲣⲡ
to search, to look for	ϣⲓⲛⲉ	ϣⲓⲛⲓ	ⲕⲱⲧⲉ	ⲕⲱϯ

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[426] Böhlig (1954: 382).

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servant	ϩⲙϩⲁⲗ	ⲙϩⲁⲗ	(not attested)	ⲃⲱⲕ
some, any	ⲗⲁⲁⲩ	ⲗⲁⲩ	(not attested)	ϩⲗⲓ
to throw	ⲛⲟⲩϫⲉ	ⲛⲟⲩϫ	ϩⲓⲟⲩⲉ	ϩⲓⲟⲩⲓ
tooth	ⲟⲃϩⲉ	(not attested)	ⲛⲁϫϩⲉ	ⲛⲁϫϩⲓ
up, upward	ⲉϩⲣⲁⲓ	ⲉϩⲣⲏⲓ	ⲉⲡϣⲱⲓ	ⲉⲡϣⲱⲓ
very	ⲉⲙⲁⲧⲉ	(not attested)	ⲉⲙⲁϣⲟ	ⲉⲙⲁϣⲱ
way	ϩⲓⲏ	(not attested)	ⲙⲟⲉⲓⲧ	ⲙⲱⲓⲧ
(conjunction marking purpose clauses)	ϫⲉⲕⲁⲥ	ϫⲉⲭⲁⲥ	(not attested)	ϩⲓⲛⲁ

These lexical differences can have various etymological backgrounds. Sometimes a Greek loan is prevalent in Sahidic, whereas Bohairic has retained the Egyptian word (e.g. ^{s}ⲕⲁⲣⲡⲟⲥ vs. ^{b}ⲟⲩⲧⲁϩ < *wdḥ* "fruit"). Or Bohairic has a Greek borrowing whereas Sahidic prefers a native term (e.g. ^{b}ⲡⲱⲥ vs. ^{s}ⲛⲁϣ ⲛϩⲉ "how?"). In some cases the words of both dialects are well known in Egyptian with no evident semantic distinction (e.g. ^{s}ⲥⲱϣⲉ < *sḫ.t* "field" vs. ^{b}ⲓⲟϩⲓ < *ꜣḥ.t* "field"). It is possible that this reflects dialectal differences in Pre-Coptic Egyptian, but this question is still to be investigated. In other cases, Sahidic has retained the ordinary Egyptian word of the same meaning but Bohairic uses a term of more recent origin (^{s}ϩⲏ < *ẖ.t* vs. ^{b}ⲛⲉϫⲓ "belly"). Or finally, Bohairic has retained the Egyptian word whereas the preferred Sahidic term is an innovation (^{b}ⲙⲓⲥⲓ < *ms.t* "to give birth" vs. ^{s}ϫⲡⲟ < *ḏi̯.t ḫpr* "to cause to exist").

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Selective index

This index does not include all Egyptian words and topics discussed in this book, but only those where I found it necessary. This can mean that:

- I have discussed an issue or a word at a place in this book which the reader would otherwise find with difficulty;
- I have proposed a new phonological interpretation of a word or forwarded a new argument which is relevant to its phonological interpretation;
- I have proposed a new etymology;
- I have supported an etymology which is not yet well known;
- I have cited new relevant literature on a word to which I wish to draw the reader's attention.

Words and topics are omitted from this index in cases such as the following:

- I have discussed an issue or a word at a place in this book which should be obvious from the table of contents;
- I have nothing new to say to a specific word but merely cite it to support my argument.

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Egyptian and Coptic words

Items beginning with ‹ꜣ›, ‹j›, ‹ꜥ›, and vowels

ꜣs(j)r	ⲟⲩⲥⲓⲣⲉ	Osiris (god)	§ 5.9.3
ꜣšr	ⲱⲣϣ	to roast	§ 3.11.3
ꜣṯp	ⲱⲧⲡ	to load, to carry	§ 3.9.2, note in 4.5.1
iꜣq.t	ⲏϭⲉ	leek	§ 3.7.3
iy.t~iw.t	ⲉⲓ	to come	§ 3.13.3
iꜥ.t	ⲉⲓⲱ	to wash	§ 5.8.6.4
iwr.ti	ⲉⲉⲧ	to be pregnant (stative)	note in § 3.14.2.2
i(w)f	ⲁϥ	flesh	note in § 3.14.2.2
im		give! (imperative)	☞ *mi* below
	ⲁⲙⲁϩⲧⲉ	to seize	§ 5.8.6.8
	ⲉⲙⲏⲣⲉ	inundation	§ 3.17.3

i(w)nw	ⲱⲛ	Heliopolis (toponym)	note in § 3.14.2.2
inn	ⲁ(ⲛⲟ)ⲛ	we	§ 3.6.2, 3.15
(i)rm	^{b}ⲛⲉⲙ	with	§ 3.16.4.3
iḥ.w	-ⲏϩ	cows	§ 6.2.2.4
	^{b}ⲁϧⲱⲓⲣⲓ ~ ⲁϧⲱⲣⲓ	viper	§ 3.17.3
	ⲓϣ	urine	note in § 3.14.2.2
itn		sun	§ 3.14.5
ꜥꜣ	ⲧⲁⲓ	here	note in § 3.6.2
ꜥꜣ.w	-ⲱⲟⲩ ~ -ⲟⲉⲓ	great (pl.)	§ 3.14.2.4
ꜥb	ⲧⲁⲡ ~ ^{b}ϩⲱⲃ	horn	note in § 3.6.2
ꜥnḫ	ⲱⲛϩ	to live	§ 5.7.2
ꜥḫi	ⲉⲓϣⲉ	to lift	§ 3.6.4.2
ꜥḫmw ~ ꜥšmw ~ ꜥḫmw	^{b}ⲗⲁϧⲉⲙ	twigs	§ 3.6.4.4

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Items beginning with ‹w›, ⲟⲩ

	ⲟⲩ	what?	§ 5.10.2
-w	-ⲟⲩ	(suffix 3rd pers. pl.)	note in § 3.13.2, 3.14.2.7
	-ⲟⲟⲩⲉ	(plural suffix)	§ 5.6.6.2
wꜣḏ	ⲟⲩⲱⲧ	green	§ 3.9.2
wꜥw	ⲟⲩⲁ	one	§ 3.6.2
	ⲟⲩⲟⲉⲓⲛ	light	§ 3.17.4
wn-ḥr	ⲟⲩⲱⲛϩ	to reveal	§ 6.2.2.2
wzš.t		urine	note in § 3.14.2.2
ꜣs(j)r	ⲟⲩⲥⲓⲣⲉ	Osiris (god)	§ 5.9.3
wḏꜣ	ⲟⲩⲉⲓⲧⲉ	to go away	§ 5.6.7.1
wḏꜣ	ⲟⲩϫⲁⲓ	to prosper	§ 5.6.7.1
wdḥ	ⲟⲩⲧⲁϩ	fruit	§ 5.9.3

Items beginning with labials

bꜣꜣ	ⲃⲁⲗ	eye	§ 3.11.6
bwpy-	ⲙⲡⲉ-	(neg. perf. prefix)	note in § 5.10.8
mn.t	ⲃⲏⲛⲉ	swallow	§ 3.16.4.11, 5.6.4.2
bnf		gall	§ 4.11.4
bnr ~ *bni* ~ *bn*		to be sweet	§ 3.13.5
bgꜣ	^{b}ⲃⲓϫⲓ	to be wrecked	§ 5.6.7.1
pꜣ hrw	ⲡⲟⲟⲩ	today	§ 3.2.4, note in § 5.5.10.1
pꜣ-n	ⲡⲁ	(possess. prefix)	§ 3.14.5
pꜣq	ⲡⲁⲕⲉ	thin	§ 4.11.4
pw		(enclitic particle)	§ 6.3
pnq		to bale out	§ 4.11.4
psi̯ ~ *fsi̯*	ⲡⲓⲥⲉ	to cook	§ 3.12.2
p(t)r		bandages	note in § 3.14.3.2
ptr	ⲡⲱⲱⲣⲉ	to see; to dream	§ 4.8.4

Items beginning with nasals

m-ꜥ, *m-dj*	ⲛⲧⲉ-	near, with	note in § 3.6.2, § 3.16.2
mi (?)	^{b}ⲙⲟⲓ, ^{s}ⲙⲁ-	give! (imperative)	§ 3.13.2, 3.14.2.1, 6.2.1
mꜣꜣ ~ *mꜣn*		to see	§ 3.16.6
mꜣꜥ.t	ⲙⲉ	truth	§ 5.8.6.4
miz.t	^{o}ⲙⲁⲟⲩⲥⲉ	liver	§ 3.13.5, 5.6.3.2
mw.t		Mut (goddess)	§ 3.14.3.6
mwt	ⲙⲟⲩ	to die	§ 3.14.3.5
mwt	ⲙⲟⲩⲟⲩⲧ	to kill	§ 3.14.3.5
bwpy-	ⲙⲡⲉ-	(neg. perf. prefix)	note in § 5.10.8
mn.t	ⲃⲏⲛⲉ	swallow	§ 3.16.4.11, 5.6.4.2
mr-wr(r)		(holy bull)	§ 6.2.2.2
mri̯.t	ⲙⲉ	to love	§ 3.14.2.7, 5.8.6.4
mḫꜣ	ⲙⲓϣⲉ	to attack	§ 5.6.7.1
mšꜥ	^{a}ⲙⲁⲁϩⲉ	to walk	§ 3.6.4.3
mdn	ⲙⲧⲟⲛ	to rest	appendix 5
n.t		Neith (goddess)	§ 3.14.3.6
nꜣ-n	ⲛⲟⲩ-	(possess. pronoun)	§ 5.6.3.3
nwꜣ	ⲛⲁⲩ	to see	§ 3.14.2.4, 3.16.3
nbi	ⲗⲓⲃⲉ	to burn; to rage	§ 3.16.4.8, 5.6.7.1
(i)rm	^{b}ⲛⲉⲙ	with	§ 3.16.4.3
nm(ꜥ)	-ⲛⲏⲃ	to sleep	§ 3.16.4.6
nnw	ⲛⲟⲩⲛ	primeval water	§ 3.16.4.5
(n)ḫb		al-Kāb (toponym)	§ 3.8.5
nhr	^{b}ⲛϩⲟⲩⲣ	horror	§ 3.2.4
ns	ⲗⲁⲥ	tongue	§ 3.11.7

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nzw		king	§ 5.10.8

Items beginning with liquids

r	ⲣⲟ	mouth	§ 4.8.2
r-prj.t	ⲣⲡⲉ	temple	§ 3.14.2.7, 5.8.6.4
rwi	ⲗⲟ	to depart	§ 3.14.2.4
nbi̯	ⲗⲓⲃⲉ	to burn; to rage	§ 3.16.4.8
rḫt	ⲣⲱϩⲉ	to wash	§ 3.14.3.5
rḫt	ⲣⲱϩⲧ	to pound	§ 3.14.3.5
ns	ⲗⲁⲥ	tongue	§ 3.11.7

Items beginning with ‹h›, ‹ḥ› , ϩ

ḥꜣ ~ ḥnr		(exclamation of desire)	§ 3.11.6
ḥꜣ.ti	ϩⲟⲩⲉⲓⲧ	first	§ 5.9.3
hꜣnw	ϩⲟⲉⲓⲙ	wave	§ 3.16.3, 3.17.4
ḥꜣq		to capture	§ 3.7.3
ḥꜣd	ϩⲓⲉⲓⲧ	pit	note in § 5.3.3
hi	ϩⲁⲓ	husband	§ 3.13.2
ḥw.t-nṯr		temple	§ 6.2.2.2
ꜥb	ᵇϩⲁⲡ ~ ᵇϩⲱⲡ ~ ᵇϩⲱⲃ	horn	note in § 3.6.2
	ϩⲟⲙⲉ	bowl	§ 3.16.3
	ϩⲙⲏ~ ϩⲏⲙⲏ~ ϩⲩⲙⲏ	pelican	§ 3.16.3
ḥmsi̯	ϩⲙⲟⲟⲥ	to sit	appendix 8
ḥn.t		pelican	§ 3.16.3
ḥnw.t		bowl	§ 3.16.3
ḥb	ϩⲏⲃⲉ	grief	§ 3.17.3
gbyr	ϩⲃⲟⲩⲣ	left (side)	§ 5.6.4.2
ḥbsy.t		concubine(?)	§ 3.13.3
ḥfꜣw.w	ϩⲃⲟⲩⲓ	snakes	§ 3.12.5, 5.6.6.1
hrw	ϩⲟⲟⲩ	day	§ 3.14.3.7, note in § 5.6.6.3

ḥqr.ti	ϩⲕⲟⲉⲓⲧ	to be hungry (stat.)	§ 3.14.3.7

Items beginning with ‹ḫ›, ‹ẖ›

ḫꜣḏw		dough	§ 4.11.4
ḫy	ϣⲓⲁⲓ	to be high	§ 3.6.4.2
ḫꜥr	ϣⲁⲁⲣⲉ	to hit	§ 3.17.3
ḫb		al-Kāb (toponym)	§ 3.8.5
ḫpš	ϣⲱⲡϣ	foreleg	§ 4.11.4
ḫnnws	ϣⲟⲗⲙⲉⲥ	mosquito	§ 3.16.3
ḫr-f	ˡϩⲁϥ	so says he	§ 3.14.3.7
ẖꜥq	ϩⲱⲱⲕⲉ	to shave	§ 4.11.4
ẖꜣk-ib		disaffected person	§ 4.11.4

Items beginning with ‹z›, ‹s›

zjnw	ⲥⲁⲉⲓⲛ	physician	§ 3.17.4
swn	ⲥⲟⲟⲩⲛ	to know	§ 3.17.4
-sn	-ⲥⲉ ~ -ⲥⲟⲩ	(suff. 3rd pers. pl.)	§ 3.14.5
sn-tꜣ ~ snt		to kiss the ground	§ 6.2.2.2
sr.t	ⲥⲟⲩⲣⲉ	thorn	§ 5.6.4.1
sqr		to hit	note in § 3.7.3
sgꜣ	ⲥⲓϭⲉ	to be rigid	§ 5.6.7.1
sgnn	ⲥⲟϭⲛ	ointment	§ 3.7.7
stš ~ stḫ ~ stẖ ~ stj	ᵃⲥⲏⲧ	Seth (god)	§ 4.8.3
sṯꜣ	ⲥⲱⲧ(ⲉ)	to draw	§ 5.8.6.8

Items beginning with ‹š›

(r)-šꜣꜥ-m-ḏr-	ϣⲁⲛⲧ-	since ..., until ...	§ 3.6.4.4, 5.7.3
šꜥ(d)	ϣⲱⲱⲧ	to cut	§ 3.6.2
šnṯ	ϣⲱⲛⲧ	to oppose	§ 4.11.4
šnḏ.wt	ϣⲛⲧⲱ	loincloth	§ 4.11.4
šr.t	ϣⲁ	nose	§ 3.14.3.5, note in § 5.10.2

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	ϣⲱⲱϭⲉ	to smite	note in § 3.7.3

Items beginning with velars

kꜣ.t		work	§ 3.13.3
kꜣ-ḥr-kꜣ	ⲕⲟⲓⲁϩⲕ	(a month)	§ 6.2.2.2, 6.2.2.4
qꜣy.t	ⲕⲁⲓⲉ	field	§ 5.3.1, 5.8.6.4
qi	ϭⲓ-	form	§ 3.7.3
ky	ⲕⲉ ~ ϭⲉ	other	§ 3.9.4.3
qꜣꜥ	ⲕⲁ-ⲃⲟⲗ	to vomit	§ 3.6.4.5
gꜣw	ⲕⲟⲩⲓ	narrow, little	§ 3.7.6, 3.14.2.4, 5.6.6.1
kꜣp		to burn incense	§ 4.11.4
kꜣnw	ϭⲱⲙ	vineyard	§ 3.9.4.3, 3.16.3
gbyr	ϩⲃⲟⲩⲣ	left (side)	§ 5.6.4.2
gbgb	ϭⲃϭⲱⲃ-	to be weak	§ 3.7.7
qfn		to bake	§ 3.7.7
qmꜣ	ⲕⲓⲙ	to throw; to move	§ 5.6.7.1
qni̯	^{b}ϭⲛⲟ	to be strong	§ 3.7.3
gnn	ϭⲛⲟⲛ	to be weak	§ 3.7.7
gnḫ.t		star	§ 4.11.4
qnqn	ⲕⲙⲕⲙ	to beat	§ 3.7.4
qnd	ϭⲱ̈ⲛⲧ	to be angry	§ 3.7.3
gr-n-p.t	ϭⲣⲟⲟⲙⲡⲉ	dove	§ 6.2.2.2
qri	ϭⲟⲉⲓⲗⲉ	to visit	§ 3.7.3
qrr.t	ϭⲗⲓⲗ	burnt-offering	§ 3.7.3
grḥ	ϭⲱⲣϩ	night	note in § 5.6.6.3
krḥt	ϭⲁⲗⲁϩⲧ	pot	appendix 5
qrs.t	ⲕⲁ(ⲉ)ⲓⲥⲉ	burial	§ 3.14.3.7, 5.6.6.2
	ϭⲗⲟϭ	(a vegetable)	§ 3.7.7
qḥqḥ	ϭⲁϩϭϩ	to hammer	§ 3.7.3
qq	ϭⲱϭ	to eat; to roast	§ 3.7.3

	ⲕⲧⲟ	to turn	§ 4.9.2.3
	ϭⲟⲧ	size, form	note in § 3.7.3
qd		character, nature	note in § 3.7.3

Items beginning with ‹d›, ‹t›

tꜣ wnw.t	ⲧⲉⲛⲟⲩ	this hour, now	note in § 3.2.4
tꜣ rnp.t	ⲧⲣⲟⲙⲡⲉ	this year	note in § 3.2.4
-ti	-ⲧⲉ ~ -ⲧⲟⲩ	(fem. dual suffix)	§ 5.8.6.8
ďi	ⲧⲁⲓ	here	note in § 3.6.2
dwn	ⲧⲱⲟⲩⲛ	to rise	§ 3.17.4
	-ⲧⲏⲩⲧⲛ	(pronoun)	§ 5.2.3.1
db	ⲧⲁⲡ	horn	note in § 3.6.2
dp.t		boat	§ 3.13.3
	ⲧⲉⲗⲏⲗ	to rejoice	§ 3.2.4
ts (djs)		(particle)	§ 3.12.3
ďšr	ⲧⲱⲣϣ	red	§ 3.8.2
ďšr.t		desert	§ 3.8.2
dgr		to plant	§ 3.7.7
dqr	ϯϭⲉ	fruit	§ 3.7.7, 3.16.6

Items beginning with ‹ḏ›, ‹ṯ›

ḏꜣr.t	ϫⲓⲉⲓⲣⲉ / ϫⲓⲉⲓⲗⲉ	fruit of the carob-tree	§ 3.11.3
ḏꜣḏꜣ	ϫⲱϫ	head	§ 4.8.7
ḏꜥrw	^{b}-ϫⲟⲩⲗ	web(?)	§ 5.6.4.1
ḏbꜣ	ⲧⲱⲱⲃⲉ	to repay	§ 5.8.6.8
ṯbw.t	ⲧⲟⲟⲩⲉ	sandal(s)	§ 3.16.6, 5.6.6.2
ṯnw	ⲧⲱⲛ	where?	§ 5.7.2
ṯzi̯.w	ϫⲟⲥⲉ	to be supreme (stat.)	§ 5.8.6.7
ḏd	ϫⲱ	to say	note in § 3.3.1, § 3.14.4
ḏdꜣ	ϫⲧⲁⲓ	to grow fat	§ 5.6.7.1

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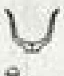
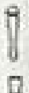
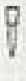
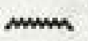
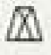
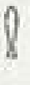
Egyptian proper names in cuneiform transcription

bu-kur-ni-ni-IP	§ 5.5.2
pa-ri-iḫ-na-PI	note in § 3.14.2.4
na-ap-te-ra	§ 3.14.8

Words in other languages

Semitic	√*wrq*	green	§ 3.7.3, 3.9.2
Semitic	√*krm*	vineyard	§ 3.16.3
Semitic	√*lqḥ*	to take	§ 3.7.3
Semitic	√*mtn*	immobile, slow	appendix 5
Semitic	√*rkb*	to mount, to ride	§ 3.9.2, note in § 4.5.1
Semitic	√*tkl*	to plant	§ 3.7.7
Arabic	*ʔAbnūb* ابنوب	(toponym)	appendix 9
Arabic	*ʔAllāh* الله	God	§ 5.6.4.3
Arabic	*sarwa*^{t}- سروة	arrow	note in § 5.6.4.1
Arabic	*šaǧǧa* شج	to break, to cleave, to split	note in § 3.7.3
Arabic	*qadd-* قد	stature, figure, size	note in § 3.7.3
Arabic	*qawiya* قوى	to be strong	§ 3.7.3
Hebrew	*sɪrɪm* סִירִים	thorns	note in § 5.6.4.1
Old Nubian	ⲦⲞ(ϨⲞ)ⲚⲆⲈ	altar	§ 6.2.2.2
Latin	*columba*	dove	note in § 6.2.2.2
Russian	го́лубь	dove	note in § 6.2.2.2
English	*bark (ship)*		§ 2.9.5
English	*ebony*		§ 2.9.5
English	*gum*		§ 2.9.5
English	*ibis*		§ 2.9.5
English	*myth*		§ 2.9.5
English	*natron*		§ 2.9.5
English	(*river*) *Nile*		§ 3.16.4.5
English	*oasis*		§ 2.9.5

Hieroglyphs

	(F13)	§ 2.5.8
	(T8)	§ 2.5.8
	(U23)	§ 2.5.8
	(V33)	§ 3.7.6
	(N35)	§ 3.16.3
	(T28)	§ 2.5.8
	(U36)	§ 2.5.8

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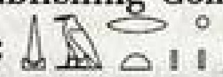
Aufrère, Sydney 1983: , la pulpe de coloquinte ou de caroube?, in *BIFAO* 83: 28-31

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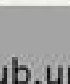
— 1985: Die Lesung von  »Regierungsjahr« als *rnpt-zp*, in Deutsches Archäologisches Institut (1985: 85-96)

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[429] The text was written around 1923 but did not find its way to printing due to the author's early death.

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Abbreviations of journals

AÄA	*Archiv für Ägyptische Archäologie*, Wien: H. Balcz & E. Komorzyński
AcOr	*Acta Orientalia*, Lugduni Batavorum: E.J. Brill / [from vol. 21:] Havniæ: Ejnar Munksgaard
Aegyptus	*Aegyptus, Rivista italiana di egittologia e di papirologia*, Milano
AfO	*Archiv für Keilschriftforschung. Internationale Zeitschrift für die Wissenschaft vom Alten Orient* / [from vol. 3:] *Archiv für Orientforschung. Internationale Zeitschrift für die Wissenschaft vom Vorderen Orient*, Berlin/ Graz/ Horn/ Wien
AJSL	*The American Journal of Semitic Languages and Literatures*, Chicago
AnthrL	*Anthropological Linguistics*: Indiana University, Anthropology Department
AÖAW	*Anzeiger der philosophisch-historischen Klasse der Österreichischen Akademie der Wissenschaften*, Wien: Österreichische Akademie der Wissenschaften
AoF	*Altorientalische Forschungen*, Berlin: Akademie-Verlag
ArOr	*Archiv Orientální*, Praha: Orientální ústav
ASAE	*Annales du Service des Antiquités Égyptiennes* (Arabic by-title: *Ḥawlīyātu Hayʾati l-ʾĀṯāri l-Maṣrīya*), Le Caire: Service des Antiquités Égyptiennes
BASOR	*Bulletin of the American Schools of Oriental Research*, American Schools of Oriental Research
BSAC	*Bulletin de la Société d'Archéologie Copte* (Arabic by-title: *Maǧallatu Ǧamʿīyati l-ʾĀṯāri l-Qibṭīya*), Le Caire: Société d'Archéologie Copte
BSEG	*Bulletin de la Société d'Égyptologie*, Genève: Société d'Égyptologie
BIE	*Bulletin de l'Institute de l'Égypte*, Le Caire
BIFAO	*Bulletin de l'Institut Français d'Archéologie Orientale*, Le Caire: Institut Français d'Archéologie Orientale
BiOr	*Bibliotheca Orientalis*, Leiden: Nederlands Instituut voor het Nabije Oosten
BN	*Biblische Notizen, Beiträge zur exegetischen Diskussion*, Bamberg/ München: Manfred Görg
BSLP	*Bulletin de la Société de Linguistique de Paris*, Paris: Klincksieck
BzS	*Beiträge zur Sudanforschung*, Wien-Mödling
CdÉ	*Chronique d'Égypte*, Bruxelles/ Brussel: Fondation Égyptologique Reine Élisabeth/ Egyptologische Stichting Koningin Elisabeth
CWPL	*Calgary Working Papers in Linguistics*, Calgary: Department of Linguistics
DE	*Discussions in Egyptology*, Oxford
Enchoria	*Enchoria, Zeitschrift für Demotistik und Koptologie*, Wiesbaden: Otto Harrassowitz
EVO	*Egitto e Vicino Oriente*, Pisa
GBS	*Göttinger Beiträge zur Sprachwissenschaft*, Göttingen: Peust & Gutschmidt
GGA	*Göttingische Gelehrte Anzeigen*, Göttingen: Vandenhoeck & Ruprecht
Glotta	*Glotta, Zeitschrift für griechische und lateinische Sprache*, Göttingen: Vandenhoeck und Ruprecht
GM	*Göttinger Miszellen, Beiträge zur ägyptologischen Diskussion*, Göttingen: Seminar für Ägyptologie und Koptologie
Iraq	*Iraq*, London: British School of Archaeology in Iraq

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JAAL	*Journal of Afroasiatic Languages*, New York: Princeton University Press
JAL	*Journal of African Languages*, London
JAOS	*Journal of the American Oriental Society*: American Oriental Society
JARCE	*Journal of the American Research Center in Egypt*, New York: American Research Center in Egypt
JCoSt	*Journal of Coptic Studies founded by the International Association for Coptic Studies*, Louvain: Peeters
JCS	*Journal of Cuneiform Studies*: American Schools of Oriental Research
JEA	*The Journal of Egyptian Archaeology*, London: The Egypt Exploration Society
JEOL	*Jaarbericht van het vooraziatisch-egyptisch gezelschap Ex Oriente Lux*, Leiden: Ex Oriente Lux
JNES	*Journal of Near Eastern Studies, continuing the American Journal of Semitic Languages and Literatures*, Chicago: University of Chicago Press
JSAI	*Jerusalem Studies in Arabic and Islam*, Jerusalem: The Hebrew University
JSS	*Journal of Semitic Studies*, Manchester
Kêmi	*Kêmi. Revue de philologie et d'archéologie égyptiennes et coptes*, Paris: Paul Geuthner
Kush	*Kush*, Khartoum: Sudan Antiquities Service
Language	*Language. Journal of the Linguistic Society of America*, Baltimore
LingAeg	*Lingua Aegyptia, Journal of Egyptian Language Studies*, Göttingen: Seminar für Ägyptologie und Koptologie / Los Angeles: Department of Near Eastern Languages and Cultures
Linguistics	*Linguistics, An international review* / [from vol. 215:] *Linguistics, An interdisciplinary journal of the language sciences*, The Hague: Mouton
LOAPL	*Langues Orientales Anciennes, Philologie et Linguistique*, Louvain: Peeters
MDAIK	*Mitteilungen des Deutschen Instituts für Ägyptische Altertumskunde in Kairo* / [from vol. 14:] *Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo*, Augsburg/ Berlin/ Wiesbaden/ Mainz
MIO	*Mitteilungen des Instituts für Orientforschung*, Berlin: Akademie-Verlag
MNL	*Meroitic Newsletter, Bulletin d'Informations Méroïtiques*, Paris
MSLP	*Mémoires de la Société de Linguistique de Paris*, Paris: Klincksieck
MSS	*Münchener Studien zur Sprachwissenschaft*, München
Muséon	*Le Muséon, Revue internationale* / [from vol. 16:] *Le Muséon et la Revue des religions, Études historiques, ethnographiques et religieuses* / [from vol. 19:] *Le Muséon, Études philologiques, historiques et religieuses* / [from vol. 27:] *Le Muséon, Revue d'études orientales*, Louvain
NchrGWG	*Nachrichten der Gesellschaften der Wissenschaften zu Göttingen. Philologisch-historische Klasse*, Göttingen
Nubica	*Nubica, Internationales Jahrbuch für äthiopische, meroitische und nubische Studien*, herausgegeben von Piotr O. Scholz und C. Detlef G. Müller, Köln: Jürgen Dinter
OA	*Oriens Antiquus. Rivista del centro per le antichità e la storia dell'arte del Vicino Oriente*, Roma: Centro per le Antichità e la Storia dell'Arte del Vicino Oriente
OLP	*Orientalia Lovaniensia Periodica*, Leuven: Departement Oriëntalistiek

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OLZ	*Orientalistische Litteratur-Zeitung* / [from vol. 12:] *Orientalistische Literaturzeitung. Monatsschrift für die Wissenschaft vom vorderen Orient und seine Beziehungen zum Kulturkreise des Mittelmeers* / [from vol. 24:] *Orientalistische Literaturzeitung. Monatsschrift für die Wissenschaft vom ganzen Orient und seine Beziehungen zu den angrenzenden Kulturkreisen*, Berlin/ Leipzig
OMRO	*Oudheidkundige Mededelingen uit het Rijksmuseum van Oudheden te Leiden*, Leiden: Rijksmuseum van Oudheden
Onoma	*Onoma. Bibliographical and Information Bulletin, Bulletin d'Information et de Bibliographie*, Leuven/ Louvain: International Centre of Onomastics
Or	*Orientalia*, Roma: Pontificium Institutum Biblicum
OrChr	*Oriens Christianus. Hefte für die Kunde des christlichen Orients*, Wiesbaden: Otto Harrassowitz
OrSue	*Orientalia Suecana, An international journal of Indological, Iranian, Semitic, Turkic studies*, Uppsala
PBA	*Proceedings of the British Academy*, Oxford: Oxford University Press
PSBA	*Proceedings of the Society of Biblical Archaeology*: London
PzL	*Münchener Papiere zur Linguistik* / [from vol. 4:] *Papiere zur Linguistik*, München/ Kronberg/ Tübingen
RA	*Revue d'Assyriologie et d'Archéologie Orientale*, Paris
RB	*Revue Biblique*, Paris: École Pratique d'Études Bibliques
RdÉ	*Revue d'Égyptologie*, Paris: Société Française d'Égyptologie
RecTrav	*Recueil de travaux relatifs à la philologie et à l'archéologie égyptiennes et assyriennes*, Paris
RoczOr	*Rocznik Orientalistyczny*, Warszawa: Polska Akademia Nauk
RSO	*Rivista degli Studi Orientali*, Roma
SAK	*Studien zur Altägyptischen Kultur*, Hamburg: Helmut Buske
SUGIA	*Sprache und Geschichte in Afrika*, Hamburg: Helmut Buske
SymbOsl	*Symbolae Osloensis*, Oslo: Universitetsforlaget
TRIA	*The Transactions of the Royal Irish Academy*, Dublin: Royal Irish Academy
UF	*Ugarit-Forschungen, Internationales Jahrbuch für die Altertumskunde Syrien-Palästinas*, Kevelaer: Butzon & Bercker, Neukirchen-Vluyn: Neukirchener Verlag
WdO	*Die Welt des Orients. Wissenschaftliche Beiträge zur Kunde des Morgenlandes* / [from vol. 25:] *Die Welt des Orients*, Göttingen: Vandenhoeck & Ruprecht
Word	*Word, Journal of the Linguistic Cycle of New York* / [from vol. 25:] *Word, Journal of the International Linguistic Association*, New York
WZKM	*Wiener Zeitschrift für die Kunde des Morgenlandes*, Wien
ZA	*Zeitschrift für Assyriologie und verwandte Gebiete*, Leipzig/ Berlin/ Weimar/ Strassburg
ZÄS	*Zeitschrift für Ägyptische Sprache und Alterthumskunde* / [from vol. 38:] *Zeitschrift für Ägyptische Sprache und Altertumskunde*, Leipzig/ Berlin
ZDMG	*Zeitschrift der Deutschen Morgenländischen Gesellschaft*, Leipzig/ Wiesbaden/ Stuttgart
ZPE	*Zeitschrift für Papyrologie und Epigraphik*, Bonn: Habelt
ZPS	*Zeitschrift für Phonetik und allgemeine Sprachwissenschaft*, Berlin: Akademie-Verlag

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